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(54) Title: ANTIGENIC POLYPEPTIDES

(57) Abstract: The invention relates to a method for the identification of antigenic polypeptides, typically opsonic antigens, expressed by pathogenic microbes; vaccines comprising said antigens; and therapeutic antibodies directed to said antigenic polypeptides.

Antigenic Polypeptides

The invention relates to a method for the identification of antigenic polypeptides, typically opsonic antigens, expressed by pathogenic microbes; vaccines comprising
5 said antigens; and therapeutic antibodies directed to said antigenic polypeptides.

Microbial organisms cause a number of fatal or debilitating diseases which affect many millions of people around the world. Currently methods to control microbial organisms include the use of antimicrobial agents (antibiotics) and disinfectants.
10 These have proved to be problematic since exposure to these agents places a significant selection pressure resulting in the creation of resistant microbes which can avoid the effects of the antimicrobial agent(s). For example, recently it has been discovered that microbial organisms have become resistant to triclosan, an agent added to many disinfectants used in households and industrial environments.

15 An arguably greater problem is the evolution of antibiotic resistant strains of a number of significant pathogenic microbes.

For example, and not by way of limitation, it is estimated that there are up to
20 50 million people world-wide infected with drug resistant tuberculosis (TB) (Figures from the World Health Organisation, 1998). In the past the use of antibiotics to treat TB relied on the administration of single drugs (eg ethionamide) which promoted a relatively high frequency of resistance. For this reason, combinations of drugs are now used to treat tuberculosis. However the fatality rate in cases caused by strains
25 that are resistant to at least one drug used to treat tuberculosis still approaches 50% even when treatment is given. *Mycobacterium tuberculosis*, the causative agent of TB, is a slow growing bacteria and takes a long time to kill. Therefore, for a drug combination to be effective a person with TB must take the drug combination daily for at least six months. Accordingly, patients frequently have to take two or more
30 pills daily and this requires a regimented dosage over a relatively long period of treatment. Many patients take the medications only intermittently and therefore do

not finish the full course of therapy to completely eradicate the *M. tuberculosis* infection. Moreover, TB is strongly associated with HIV infection and therefore the establishment of TB is strongly correlated with immunosuppression.

5 Vaccination against TB has been available for many years. The bacillus calmette and guerin (BCG) vaccination has been widely used throughout the world for a long time because it is a safe and inexpensive means to vaccinate large numbers of people who potentially could contract TB. BCG is derived from live, attenuated strains of *Mycobacterium bovis*. However the impact of vaccination on the infectious forms of
10 TB is minimal and BCG has therefore contributed little to the overall control of the disease.

A further example of a pathogenic organism which has developed resistance to antibiotics is *Staphylococcus aureus*. *S.aureus* is a bacterium whose normal habitat
15 is the epithelial lining of the nose in about 20-40% of normal healthy people and is also commonly found on people's skin usually without causing harm. However, in certain circumstances, particularly when skin is damaged, this germ can cause infection. This is a particular problem in hospitals where patients may have surgical procedures and/or be taking immunosuppressive drugs. These patients are much
20 more vulnerable to infection with *S.aureus* because of the treatment they have received. Resistant strains of *S.aureus* have arisen in recent years. Methicillin resistant strains are prevalent and many of these resistant strains are also resistant to several other antibiotics. Currently there is no effective vaccination procedure for *S.aureus*. In the US, *S.aureus* infections are the cause of 13% of the two million
25 hospitalised infections each year. This represents 260,000 people with an infection of *S.aureus*, of which 60-80,000 die.

S. aureus is therefore a major human pathogen capable of causing a wide range of life threatening diseases including septicaemia, endocarditis, arthritis and toxic
30 shock. This ability is determined by the versatility of the organism and its arsenal of components involved in virulence. Pathogenicity is multifactorial and no one

component has shown to be responsible for a particular infection, see Projan, S.J. & Novick, R.P. (1997) in *The Staphylococci in Human Disease* (Crossley, K.B. & Archer, G.L., eds.) pp.55-81.

5 At the onset of infection, and as it progresses, the needs and environment of the organism changes and this is mirrored by a corresponding alteration in the virulence determinants which *S. aureus* produces. At the beginning of infection it is important for the pathogen to adhere to host tissues and so a large repertoire of cell surface associated attachment proteins are made. These include collagen-, fibrinogen- and
10 fibronectin-binding proteins. The pathogen also has the ability to evade host defences by the production of factors that reduce phagocytosis or interfere with the ability of the cells to be recognised by circulating antibodies.

Often a focus of infection develops as an abscess and the number of organisms
15 increases. *S. aureus* has the ability to monitor its own cell density by the production of a quorum sensing peptide. Accumulation of the peptide, associated with physiological changes brought about by the beginning of starvation of the cells, elicits a switch in virulence determinant production from adhesins to components involved in invasion and tissue penetration. These include a wide range of
20 hemolysins, proteases and other degradative enzymes.

During the process of any infection the virulence determinants made by *S. aureus* are produced in response to environmental and physiological stimuli. These stimuli will be dependent on the niche within the body and will change as the infection
25 progresses. Little is known of the conditions *in vivo* and it is likely that some components are produced solely in this environment. These are therefore potential vaccine components, which could not be discovered by previous techniques.

30

One of the most important developments in recent medical history is the development of vaccines which provide prophylactic protection from a wide variety of pathogenic organisms. Many vaccines are produced by inactivated or attenuated pathogens which are injected into an individual. The immunised individual responds
5 by producing both a humoral (antibody) and cellular (cytolytic T cells, CTL's) response. For example, hepatitis vaccines are made by heat inactivating the virus and treating it with a cross linking agent such as formaldehyde. An example of an attenuated pathogen useful as a vaccine is represented by polio vaccines which are produced by attenuating a live pathogen.

10

However the use of attenuated organisms in vaccines for certain diseases is problematic due to the lack of knowledge regarding the pathology of the condition and the nature of the attenuation. For certain viral agents this is a particular problem since viruses, in particular retroviruses, have an error prone replication cycle which
15 results viable mutations in the genes which comprise the virus. This can result in alterations to antigenic determinants which have previously been used as vaccines. An alternative to the use of inactivated or attenuated pathogens is the identification of pathogen epitopes to which the immune system is particularly sensitive. In this regard many pathogenic toxins produced by pathogenic organisms during an
20 infection are particularly useful in the development of vaccines which protect the individual from a particular pathogenic organism.

The development of so-called subunit vaccines (vaccines in which the immunogen is a fragment or subunit of a protein or complex expressed by a particular pathogenic
25 organism) has been the focus of considerable medical research. The need to identify candidate molecules useful in the development of subunit vaccines is apparent not least because conventional chemotherapeutic approaches to the control of pathogenic organisms has more recently been stymied by the development of antibiotic resistance. A number of methods have been developed to identify potential antigenic
30 polypeptides which can be used as a vaccine. One such method is disclosed herein.

It has been known for many years that tumour cells produce a number of tumour cell specific antigens, some of which are presented at the tumour cell surface. The immune system recognises these antigens as foreign thereby resulting in the production of antibodies to self antigens, so called autoantibodies or autologous antisera.

One such technique is Serological identification of antigens by recombinant Expression Cloning, abbreviated to SEREX.

- Typically, the technique involves the extraction of RNA from tumour tissue followed by the selective enrichment of mRNA from the isolated total RNA. The mRNA is reverse transcribed into cDNA using viral reverse transcriptase. The cDNA thus synthesised is subcloned into an expression vector and transformed into an appropriate bacterial strain. The transformed bacteria are plated onto a suitable nutrient agar and under appropriate growth conditions the subcloned cDNA is expressed from the expression vector in the bacterial cell. The cells are lysed naturally by the use of phage based expression vectors, for example λ phage or phagemid based vectors, which through their lytic cycle cause cell lysis. The released polypeptides are transferred to a suitable membrane support (i.e. nitrocellulose, nylon) and exposed to autologous antisera from the patient from which the tumour tissue was originally isolated. The immunoscreening methodology allows the identification of genes that are over expressed or inappropriately expressed in a selected tumour tissue from a patient.
- We have exploited this technique to identify antigenic polypeptides expressed by pathogenic organisms during an infection. Autologous antisera produced during the infection is used to screen an expression library created from genomic DNA to identify and clone antigens.

In its broadest aspect the invention relates to the identification of antigenic polypeptides expressed during an infection by a pathogenic microbe and their use in vaccination.

5 According to a first aspect of the invention there is provided a method to identify opsonic antigens expressed by pathogenic organisms comprising:

- (i) providing a nucleic acid library encoding genes or partial gene sequences of a pathogenic organism;
- 10 (ii) transforming/transfecting said library into a host cell;
- (iii) providing conditions conducive to the expression of said transformed/transfected genes or partial gene sequences;
- 15 (iv) contacting the antigens expressed by the genes/partial gene sequences with autologous antisera derived from an animal infected with, or has been infected with, said pathogenic organism;
- (v) purifying the nucleic acid encoding the antigens or partial antigenic polypeptides binding to said autologous antisera; and
- 20 (vi) testing the opsonic activity of a polypeptide encoded by said DNA molecule.

In a preferred method of the invention said library comprises genomic DNA of a pathogenic organism.

25

Ideally said pathogenic organism is bacterial.

More preferably still said bacterial organism is selected from the following:

- 30 *Staphylococcus aureus*; *Staphylococcus epidermidis*; *Enterococcus faecalis*;
Mycobacterium tuberculosis; *Streptococcus group B*; *Streptococcus pneumoniae*;
Helicobacter pylori; *Neisseria gonorrhea*; *Streptococcus group A*; *Borrelia*

burgdorferi; *Coccidioides immitis*; *Histoplasma sapsulatum*; *Neisseria meningitidis* type B; *Shigella flexneri*; *Escherichia coli*; *Haemophilus influenzae*.

Preferably still said pathogenic organism is of the genus *Staphylococcus spp.* Ideally
5 organism is *Staphylococcus aureus* or *Staphylococcus epidermidis*.

In a further preferred embodiment of the invention said nucleic acid library is a lambda library, ideally a lambda expression library.

10 According to a second aspect of the invention there is provided a nucleic acid molecule comprising a DNA sequence selected from:

(i) the DNA sequence as represented by the DNA sequences herein disclosed in Table 7 or Table 9;

15

(ii) DNA sequences which hybridise to the sequences identified in (i) above which encode a polypeptide expressed by a pathogenic organism and.

(iii) DNA sequences which are degenerate as a result of the genetic code to the
20 DNA sequences defined in (i) and (ii).

In a yet still further preferred embodiment of the invention said nucleic acid molecule is genomic DNA.

25

In a preferred embodiment of the invention there is provided an isolated nucleic acid molecule which anneals under stringent hybridisation conditions to the sequences herein disclosed.

30 Stringent hybridisation/washing conditions are well known in the art. For example, nucleic acid hybrids that are stable after washing in 0.1xSSC, 0.1% SDS at 60°C. It

is well known in the art that optimal hybridisation conditions can be calculated if the sequences of the nucleic acid is known. For example, hybridisation conditions can be determined by the GC content of the nucleic acid subject to hybridisation. Please see Sambrook *et al* (1989) Molecular Cloning; A Laboratory Approach. A common
5 formula for calculating the stringency conditions required to achieve hybridisation between nucleic acid molecules of a specified homology is:

$$T_m = 81.5^{\circ} \text{C} + 16.6 \text{ Log } [\text{Na}^+] + 0.41 [\% \text{ G} + \text{C}] - 0.63 (\% \text{formamide}).$$

10 According to a third aspect of the invention there is provided at least one polypeptide identified by the method according to the invention.

In a preferred embodiment of the invention, said polypeptide is associated with infective pathogenicity of an organism according to any previous aspect or
15 embodiment of the invention.

More preferably still said polypeptide is at least one, or part part thereof, of the amino acid sequences represented in Tables 8 or Table 10.

20 In an alternative preferred embodiment of the invention said polypeptide carries a non-protein antigen, for example a polysaccharide antigen.

According to a fourth aspect of the invention there is provided a nucleic acid molecule characterised in that said nucleic acid molecule is part of a vector adapted
25 to facilitate recombinant expression of the polypeptide encoded by said nucleic acid molecule.

In a preferred embodiment of the invention said vector is an expression vector adapted for prokaryotic gene expression. Alternatively said expression vector is
30 adapted for eukaryotic gene expression.

Typically said adaptation includes, by example and not by way of limitation, the provision of transcription control sequences (promoter sequences) which mediate cell specific expression. These promoter sequences may be cell specific, inducible or constitutive.

5

Promoter is an art recognised term and, for the sake of clarity, includes the following features which are provided by example only, and not by way of limitation. Enhancer elements are *cis* acting nucleic acid sequences often found 5' to the transcription initiation site of a gene (enhancers can also be found 3' to a gene sequence or even located in intronic sequences and is therefore position independent). Enhancers function to increase the rate of transcription of the gene to which the enhancer is linked. Enhancer activity is responsive to *trans* acting transcription factors (polypeptides) which have been shown to bind specifically to enhancer elements. The binding/activity of transcription factors (please see Eukaryotic Transcription Factors, by David S Latchman, Academic Press Ltd, San Diego) is responsive to a number of environmental cues which include, by example and not by way of limitation, intermediary metabolites (eg glucose, lipids), environmental effectors (eg light, heat,).

20 Promoter elements also include so called TATA box and RNA polymerase initiation selection (RIS) sequences which function to select a site of transcription initiation. These sequences also bind polypeptides which function, *inter alia*, to facilitate transcription initiation selection by RNA polymerase.

25 Adaptations also include the provision of selectable markers and autonomous replication sequences which both facilitate the maintenance of said vector in either the eukaryotic cell or prokaryotic host. Vectors which are maintained autonomously are referred to as episomal vectors.

30 Adaptations which facilitate the expression of vector encoded genes include the provision of transcription termination/polyadenylation sequences. This also includes

the provision of internal ribosome entry sites (IRES) which function to maximise expression of vector encoded genes arranged in bicistronic or multi-cistronic expression cassettes.

- 5 These adaptations are well known in the art. There is a significant amount of published literature with respect to expression vector construction and recombinant DNA techniques in general. Please see, Sambrook et al (1989) Molecular Cloning: A Laboratory Manual, Cold Spring Harbour Laboratory, Cold Spring Harbour, NY and references therein; Marston, F (1987) DNA Cloning Techniques: A Practical
10 Approach Vol III IRL Press, Oxford UK; DNA Cloning: F M Ausubel et al, Current Protocols in Molecular Biology, John Wiley & Sons, Inc.(1994).

According to yet a further aspect of the invention there is provided a method for the production of the polypeptides according to any previous aspect or embodiment of
15 the invention comprising:

- (i) providing a cell transformed/transfected with a vector according to the invention;
- (ii) growing said cell in conditions conducive to the manufacture of said polypeptides; and
- 20 (iii) purifying said polypeptide from said cell, or its growth environment.

In a preferred method of the invention said vector encodes, and thus said recombinant polypeptide is provided with, a secretion signal to facilitate purification of said polypeptide.

25

According to a fifth aspect of the invention there is provided a cell or cell-line transformed or transfected with the vector according to the invention.

In a preferred embodiment of the invention said cell is a prokaryotic cell.
30 Alternatively said cell is a eukaryotic cell selected from: fungal, insect, amphibian; mammalian; plant.

According to a yet further aspect of the invention there is provided a vaccine comprising at least one antigen or antigenic polypeptide according to the invention.

5 Ideally said vaccine further comprises a carrier and/or adjuvant.

The terms adjuvant and carrier are construed in the following manner. Some polypeptide or peptide antigens contain B-cell epitopes but no T cell epitopes. Immune responses can be greatly enhanced by the inclusion of a T cell epitope in the
10 polypeptide/peptide or by the conjugation of the polypeptide/peptide to an immunogenic carrier protein such as key hole limpet haemocyanin or tetanus toxoid which contain multiple T cell epitopes. The conjugate is taken up by antigen presenting cells, processed and presented by human leukocyte antigens (HLA's) class II molecules. This allows T cell help to be given by T cell's specific for carrier
15 derived epitopes to the B cell which is specific for the original antigenic polypeptide/peptide. This can lead to increase in antibody production, secretion and isotype switching.

An adjuvant is a substance or procedure which augments specific immune responses
20 to antigens by modulating the activity of immune cells. Examples of adjuvants include, by example only, agonsitic antibodies to co-stimulatory molecules, Freund's adjuvant, muramyl dipeptides, liposomes. An adjuvant is therefore an immunomodulator. A carrier is an immunogenic molecule which, when bound to a second molecule augments immune responses to the latter.

25

In yet a further aspect of the invention there is provided a method to immunise an animal against a pathogenic microbe comprising administering to said animal at least one polypeptide, or part thereof, according to the invention or the vaccine according to the invention.

30

In a preferred method of the invention said animal is human.

Preferably the vaccine, or antigenic polypeptide, can be delivered by direct injection either intravenously, intramuscularly, subcutaneously. Further still, the vaccine or antigenic polypeptide, may be taken orally.

Preferably the vaccine is against the bacterial species *Staphylococcus aureus*.

- 5 The vaccine may also be against the bacterial species *Staphylococcus epidermidis*.

It will also be apparent that vaccines or antigenic polypeptides are effective at preventing or alleviating conditions in animals other than humans, for example and not by way of limitation, family pets, livestock, horses.

- 10 According to a further aspect of the invention there is provided an antibody, or at least an effective binding part thereof, which binds at least one antigen or antigenic polypeptide according to the invention.

In a preferred embodiment of the invention said antibody is a polyclonal or monoclonal antibody wherein said antibody is specific to said polypeptide.

15

Alternatively, said antibody is a chimeric antibody produced by recombinant methods to contain the variable region of said antibody with an invariant or constant region of a human antibody.

- 20 In a further alternative embodiment of the invention, said antibody is humanised by recombinant methods to combine the complementarity determining regions of said antibody with both the constant (C) regions and the framework regions from the variable (V) regions of a human antibody.

Preferably said antibody is provided with a marker including a conventional label or tag, for example a radioactive and/or fluorescent and/or epitope label or tag.

25

Preferably said humanised monoclonal antibody to said polypeptide is produced as a fusion polypeptide in an expression vector suitably adapted for transfection or transformation of prokaryotic or eukaryotic cells.

Antibodies, also known as immunoglobulins, are protein molecules which have specificity for foreign molecules (antigens). Immunoglobulins (Ig) are a class of structurally related proteins consisting of two pairs of polypeptide chains, one pair of
5 light (L) (low molecular weight) chain (κ or λ), and one pair of heavy (H) chains (γ , α , μ , δ and ϵ), all four linked together by disulphide bonds. Both H and L chains have regions that contribute to the binding of antigen and that are highly variable from one Ig molecule to another. In addition, H and L chains contain regions that are non-variable or constant.

10

The L chains consist of two domains. The carboxy-terminal domain is essentially identical among L chains of a given type and is referred to as the "constant" (C) region. The amino terminal domain varies from L chain to L chain and contributes to the binding site of the antibody. Because of its variability, it is referred to as the
15 "variable" (V) region.

The H chains of Ig molecules are of several classes, α , μ , σ , α , and γ (of which there are several sub-classes). An assembled Ig molecule consisting of one or more units of two identical H and L chains, derives its name from the H chain that it possesses.
20 Thus, there are five Ig isotypes: IgA, IgM, IgD, IgE and IgG (with four sub-classes based on the differences in the H chains, i.e., IgG1, IgG2, IgG3 and IgG4). Further detail regarding antibody structure and their various functions can be found in, Using Antibodies: A laboratory manual, Cold Spring Harbour Laboratory Press.

25 Chimeric antibodies are recombinant antibodies in which all of the V-regions of a mouse or rat antibody are combined with human antibody C-regions. Humanised antibodies are recombinant hybrid antibodies which fuse the complementarity determining regions from a rodent antibody V-region with the framework regions from the human antibody V-regions. The C-regions from the human antibody are also
30 used. The complementarity determining regions (CDRs) are the regions within the N-terminal domain of both the heavy and light chain of the antibody to where the

majority of the variation of the V-region is restricted. These regions form loops at the surface of the antibody molecule. These loops provide the binding surface between the antibody and antigen.

- 5 Antibodies from non-human animals provoke an immune response to the foreign antibody and its removal from the circulation. Both chimeric and humanised antibodies have reduced antigenicity when injected to a human subject because there is a reduced amount of rodent (i.e. foreign) antibody within the recombinant hybrid antibody, while the human antibody regions do not illicit an immune response. This results in a weaker immune response and a decrease in the clearance of the antibody. This is clearly desirable when using therapeutic antibodies in the treatment of human diseases. Humanised antibodies are designed to have less "foreign" antibody regions and are therefore thought to be less immunogenic than chimeric antibodies.
- 10
- 15 In a further preferred embodiment of the invention said antibodies are opsonic antibodies.

- Phagocytosis is mediated by macrophages and polymorphic leukocytes and involves the ingestion and digestion of micro-organisms, damaged or dead cells, cell debris, insoluble particles and activated clotting factors. Opsonins are agents which facilitate the phagocytosis of the above foreign bodies. Opsonic antibodies are therefore antibodies which provide the same function. Examples of opsonins are the Fc portion of an antibody or compliment C3.
- 20

- 25 In another aspect of the invention there is provided a vector which is adapted for the expression of the humanised or chimeric antibodies according to the invention.

- In a yet further aspect of the invention, there is provided a cell or cell line which has been transformed or transfected with the vector encoding the humanised or chimeric antibody according to the invention.
- 30

In a yet further aspect of the invention there is provided a method for the production of the humanised or chimeric antibody according to the invention comprising :

- 5 (i) providing a cell transformed or transfected with a vector which comprises a nucleic acid molecule encoding the humanised or chimeric antibody according to the invention;
- (ii) growing said cell in conditions conducive to the manufacture of said antibody; and
- (iii) purifying said antibody from said cell, or its growth environment.

10 In a yet further aspect of the invention there is provided a hybridoma cell line which produces a monoclonal antibody as hereinbefore described.

In a further aspect of the invention there is provided a method of producing monoclonal antibodies according to the invention using hybridoma cell lines
15 according to the invention.

In a further aspect of the invention there is provided a method for preparing a hybridoma cell-line producing monoclonal antibodies according to the invention comprising the steps of:

- 20 i) immunising an immunocompetent mammal with an immunogen comprising at least one polypeptide having the amino acid sequence as represented in Table 8 or 10, or fragments thereof;
- ii) fusing lymphocytes of the immunised immunocompetent mammal with myeloma cells to form hybridoma cells;
- 25 iii) screening monoclonal antibodies produced by the hybridoma cells of step (ii) for binding activity to the amino acid sequences of (i);
- iv) culturing the hybridoma cells to proliferate and/or to secrete said monoclonal antibody; and
- v) recovering the monoclonal antibody from the culture supernatant.

30

Preferably, the said immunocompetent mammal is a mouse. Alternatively, said immunocompetent mammal is a rat.

The production of monoclonal antibodies using hybridoma cells is well-known in the art. The methods used to produce monoclonal antibodies are disclosed by Kohler and Milstein in Nature 256, 495-497 (1975) and also by Donillard and Hoffman, "Basic Facts about Hybridomas" in Compendium of Immunology V.II ed. by Schwartz, 1981, which are incorporated by reference.

In a further aspect of the invention there is provided the use of the antibodies for manufacture of a medicament for the treatment of *Staphylococcus aureus*-associated septicaemia, food-poisoning or skin disorders.

In another aspect of the invention there is provided the use of the antibodies according to the invention for the manufacture of a medicament for the treatment of *Staphylococcus epidermidis*-associated septicaemia, peritonitis or endocarditis.

It will be apparent that the polypeptides identified by the method according to the invention will facilitate the production of therapeutic antibodies to a range of diseases resulting from pathogenic infection, for example, septicaemia; tuberculosis; bacteria-associated food poisoning; blood infections; peritonitis; endocarditis; sepsis; meningitis; pneumonia; stomach ulcers; gonorrhoea; strep throat; streptococcal-associated toxic shock; necrotizing fasciitis; impetigo; histoplasmosis; Lyme disease; gastro-enteritis; dysentery; shigellosis.

As has already been stated earlier, microbial organisms cause a wide variety of diseases. Listed below, and not by way of limitation, are a number of micro-organisms and some of the diseases they cause.

Micro-organism	Disease(s) caused
<i>Staphylococcus aureus</i>	Sepsis, food poisoning, septicaemia,
<i>Staphylococcus epidermidis</i>	Peritonitis, septicaemia, endocarditis,

	other hospital-associated diseases
<i>Enterococcus faecalis</i>	Endocarditis, cystitis, wound infections
<i>Mycobacterium tuberculosis</i>	Tuberculosis
<i>Streptococcus group B</i>	Sepsis, meningitis, pneumonia, bladder infections
<i>Streptococcus pneumoniae</i>	Pneumonia, meningitis
<i>Helicobacter pylori</i>	Stomach ulcers
<i>Neisseria gonorrhoea</i>	Gonorrhoea
<i>Streptococcus group A</i>	Strep throat, necrotizing fasciitis, impetigo, Strep. Toxic shock syndrome
<i>Borrelia burgdoferi</i>	Lyme disease
<i>Coccidioides immitis</i>	Pneumonia
<i>Histoplasma sapsulatum</i>	Histoplasmosis, pneumonia
<i>Neisseria meningitidis type B</i>	Meningitis
<i>Shigella flexneri</i>	Gastro-enteritis, shigellosis, dysentery
<i>Escherichia coli</i>	Food-poisoning, gastro-enteritis
<i>Haemophilus influenzae</i>	Meningitis, pneumonia, arthritis, cellulitis

An embodiment of the invention will now be described by example only and with reference to the following materials, methods and tables:

- 5 Table 1 illustrates the immunization and bleed schedule for production of monoclonal antibodies reactive with peptide Hex A;

Table 2 illustrates an immunoassay of sera from mice immunized with peptide Hex A;

10

Table 3 illustrates an immunoassay of supernatants from anti-Hex A hybridoma supernatants;

Table 4 illustrates the immunization and bleed schedule for production of

15

monoclonal antibodies reactive with peptide 29kDa peptide;

Table 5 illustrates an immunoassay of day 98 sera from mice immunized with peptide 29kDa;

Table 6 illustrates an immunoassay of supernatants from anti-29kDa hybridomas supernatants from T75 Culture Flasks;

- 5 Table 7 represents the DNA sequences of *S.aureaus* partial gene sequences identified by the screening method;

Table 8 represents the protein sequences encoded by the DNA sequences illustrated in Table 7;

10

Table 9 represents the DNA sequences of *S.epidermidis* partial gene sequences identified by the screening method; and

- 15 Table 10 represents the protein sequences of the DNA sequences illustrated in Table 9.

Materials and Methods

Screening Genomic Libraries of *S. aureus* and *S.epidermidis*

20

A λ ZAP Express library of genomic DNA of *S. aureus* 8325/4 and *S.epidermidis* was used. It contains fragments of 2-10kb from a partial *Sau*3A digest of total genomic DNA. This was cloned into the *Bam*H1 site of the vector. The library contains >10x coverage of the genome. The library was probed by plaque lift using an initial
25 screen of approximately 20,000 plaque forming units on a 9cm diameter Petri dish. The plating cells used, their treatment, the plating procedure and buffers were exactly as described in the manufacturers handbook (Stratagene). Plating cells, *Escherichia coli* XL1-Blue MRF', were infected with phage and plated in 3 ml top LB agar containing 10 mM MgSO₄ onto LB plates containing 10 mM MgSO₄. The plates
30 were then incubated at 42°C for 4 hr. An 8.5cm diameter nitrocellulose filter disc (previously soaked in 10 mM IPTG and air-dried) was placed on each plate and its location marked. The plates were then incubated for a further 3.5 hr at 37°C. The

filters were removed and washed in TBST buffer before blocking overnight at 4°C in TBST containing 6% w/v dried skimmed milk and 3% v/v pig serum (Sigma). The serum was used to block any Protein A clones on the filter. The filters are then treated with patient serum (1/5000 dilution) in blocking solution for 90 min at room temperature. Antisera have been obtained from patients convalescing from major *S. aureus* infections. The filters are then washed for 3x10 min in TBST. Secondary antibody used was goat anti-human whole IgG alkaline phosphatase linked (Sigma) at 1/30,000 dilution in blocking solution at room temperature for 30 min. The filters were then washed as above and developed using a standard colorimetric procedure.

Cross-reactive plaques were located on the agar plates and cored into 0.2ml phage buffer with 0.02 ml chloroform. The titre of each core stock was determined and the phage plated at approximately 200 plaques per plate. A plaque lift and screen was performed as above to give single, pure cross-reactive clones.

The pure clones were then spotted (1µl) onto plates to give a confluent plaque of 0.5cm diameter. 30 individual clones can be spotted on each plate. A plaque lift is performed and the filter probed with an appropriate sera. In this way clones can be tested for their cross-reactivity with other patient sera, non-infected donor sera and anti-Protein A sera.

Individual clones were then excised to give a phagemid in *E. coli* XL0LR using the manufacturers protocol (Stratagene). A plasmid miniprep of each was carried out and the size of the genomic insert determined by restriction mapping. The identity of the cloned insert was determined by DNA sequencing using primers against vector sequence, which allows sequencing across the insert. By comparison of the derived sequence against the public domain databases the nature of the cloned gene(s) can be determined.

Hybridisation Solutions/Conditions

Typically, hybridisation conditions uses 4 – 6 x SSPE (20x SSPE contains 175.3g NaCl, 88.2g $\text{NaH}_2\text{PO}_4 \cdot \text{H}_2\text{O}$ and 7.4g EDTA dissolved to 1 litre and the pH adjusted to 7.4); 5-10x Denhardt's solution (50x Denhardt's solution contains 5g Ficoll (type 400, Pharmacia), 5g polyvinylpyrrolidone and 5g bovine serum albumen; 100µg-1.0mg/ml sonicated salmon/herring DNA; 0.1-1.0% sodium dodecyl sulphate; optionally 40-60% deionised formamide. Hybridisation temperature will vary depending on the GC content of the nucleic acid target sequence but will typically be between 42° - 65° .

Mouse Model for Testing Candidate Vaccine Polypeptides

Mice are injected intravenously with 5×10^7 *S. aureus* and mortality, bacteremia and abscess formation is monitored over the ensuing 7 days. At this dose 100% of the mice are bacteremic for greater than 4 days , 100% have detectable abscess formation in liver and kidney and greater than 80% of mice die within four days. At lower doses of injected organisms, bacteremia is detectable in the absence of death.

Immunization Program

Single proteins are injected at a dose of 10-100ug per mouse in RIBI adjuvant, boosted 14 and 28 days later and bled 14 and 28 days thereafter for evaluation of antibodies in their sera using ELISA. When groups of proteins are injected the final amount of each protein will be 10ug per mouse and the above immunization scheme will be followed.

Evaluation of Protective Efficacy of Single or Groups of Proteins

We will employ the mouse infection model described above to evaluate the protective efficacy of the proteins that are being tested. To this end groups of 5 mice will be immunized with single proteins or pools of 5 proteins as described above. We will monitor antibody titers to the injected proteins and when high titers are reached we will inoculate mice with *S aureus* at high and low dose. Control mice that have

not been immunized or that were immunized with adjuvant only will also be inoculated with *S aureus*. We will measure levels of bacteremia, abscess formation and survival in all groups. All parameters of infection will be suppressed in mice that have high circulating levels of protective antibodies. If we find a pool of proteins that induces protection we will compare the protection induced by the individual components to that induced by the pool of proteins to see if protection was induced by a single protein or by the combined action of antibodies to multiple proteins. Using this approach we will identify protein epitopes that are protective.

In addition to using the *in vivo* model of mouse infection we will also obtain the sera from mice that are injected as above and monitor their sera for opsonophagocytic activity using a complement dependent system in the presence of human polymorphonuclear lymphocytes. This assay is well known in the art. This assay has been used as an *in vitro* surrogate for measuring protective efficacy of antibody. Splens from mice that have opsonophagocytic antibodies will then be used as fusion partners in an attempt to make monoclonal antibodies that are reactive with *S. aureus*.

Using this multipronged approaches we will have a high level of confidence that we can identify protective epitopes that can be used either in a vaccine construct or that can be used to generate monoclonal antibodies.

EXAMPLE 1

Immunoassay for detection of antibodies reactive with peptide Hex A

The binding of mouse sera or MAbs to Hex A was measured by immunoassay on wells coated with Hex A. One hundred microliters of a 250 – 500 ng/ml solution of Hex A in PBS was distributed into replicate Nunc Maxisorp Stripwells and incubated overnight at room temperature. The unbound material was removed from the wells by washing four times with PBS-T. Unbound antigen was removed from the plate by washing four times with PBS-T. Antibody, diluted in PBS-T, was then added to the wells and incubated at room temperature for 30-60 minutes. After addition of the antibody, the wells were incubated at room temperature for 30-60 minutes in a draft-

free environment. The wells were again washed four times with PBS-T and ninety-five microliters of detection antibody was then added to each well. The detection antibody was either peroxidase-labeled goat anti-mouse IgG (gamma-specific), diluted 1:10000 in PBS-T, or peroxidase-labeled rabbit anti-mouse IgG₁, diluted
5 1:6000 in PBS-T.

Following another 30-60 minute incubation at room temperature, the wells were washed four times with PBS-T and each well received 100 µl of TMB substrate solution (BioF_x #TMBW-0100-01). Plates were incubated in the dark at room temperature for 15 minutes and the binding reactions were stopped by the addition of
10 100 µl of TMB stop solution (BioF_x #STPR-0100-01). The absorbance of each well was measured at 450 nm using a Molecular Devices Vmax plate reader.

Isotype was determined using a mouse immunoglobulin isotype kit obtained from Zymed Laboratories (Cat. No. 90-6550).

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Immunization of Mice for Production of Monoclonal Antibodies Reactive with Peptide Hex A.

Five female BALB/c mice, approximately 8 weeks of age, were immunized with Hex A according to the schedule described in Table 1. All immunizations were
20 administered subcutaneously in 50% RIBI adjuvant. Sera from the mice were tested by immunoassay, and based on the results of the assay described in Table 2, mouse 2021 was selected for hybridoma production. Mouse 2021 received a booster immunization of 32.5 ug of Hex A in PBS, administered intraperitoneally, three days prior to the production of hybridomas.

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TABLE 1

**Immunization and Bleed Schedule for Production of
Monoclonal Antibodies Reactive with Peptide Hex A**

Experimental Day	Boost (ug/mouse)	Adjuvant	Bleed
0	10 ug	RIBI	Yes
34	8.3	RIBI	Yes
48	None		Yes
60	25 ug	RIBI	Yes
74	None		Yes
98	25 ug	RIBI	Yes
124	None		Yes

TABLE 2

**Immunoassay of Sera from Mice
Immunized with Peptide Hex A**

Serum Dilution	2021	2022	2023	2024	2025
1000	3.553	3.569	3.226	3.336	3.439
3000	2.803	2.538	2.357	2.575	2.403
9000	1.663	1.336	1.314	1.522	1.357
27000	0.793	0.618	0.622	0.716	0.598
Buffer	0.095	0.078	0.145	0.066	0.089

Preparation of Hybridomas Reactive with Hex A Peptide

Hybridomas were prepared by the general methods of Shulman, Wilde and Kohler and Bartal and Hirshaut (34, 48). Mouse 2021 was selected for hybridoma production based on the results of an immunoassay and received a booster immunization of 32.5 ug of antigen three days prior to sacrifice. Spleenocytes from

mouse 2028 were isolated and mixed with mouse myeloma cells SP2/0 (ATCC Catalog number CRL 1581) at a ratio of 10 spleenocytes:1 myeloma. The cells were pelleted by centrifugation (400 X g, 10 minutes at room temperature) and washed in serum free medium. The supernatant was removed to near-dryness and fusion of the cell mixture was accomplished in a sterile 50 ml centrifuge conical by the addition of 1 ml of warm (37°C) polyethylene glycol (PEG; mw 1400; Boehringer Mannheim) over a period of 60-90 seconds. The PEG was diluted by slow addition of serum-free medium in successive volumes of 1, 2, 4, 8, 16 and 19 mls. The hybridoma cell suspension was gently resuspended into the medium and the cells pelleted by centrifugation (500 X g, 10 minutes at room temperature). The supernatant was removed and the cells resuspended in medium RPMI 1640, supplemented with 15% heat-inactivated fetal bovine serum, 0.05 mM hypoxanthine and 16 μ M thymidine (HT medium). One hundred μ l of the hybridoma cells were planted into 952 wells of 96-well tissue culture plates. Eight wells (column 1 of plate A) received approximately 2.5×10^4 SP/20 cells in 100 μ l. The SP/20 cells served as a control for killing by the selection medium added 24 hours later:

Twenty four hours after preparation of the hybridomas, 100 μ l of RPMI 1640, supplemented with 15% heat-inactivated fetal bovine serums, 0.1 mM hypoxanthine, 0.8 μ M aminopterin and 32 μ M thymidine (HAT medium) was added to each well. Ninety-six hours after the preparation of the hybridomas, the SP/20 cells in plate A, column 1 appeared to be dead, indicating that the HAT selection medium had successfully killed the unfused SP/20 cells.

Ten days after the preparation of the hybridomas, supernatants from all wells were tested by ELISA for the presence of antibodies reactive with peptide Hex A. Based on the results of this preliminary assay, cells from three wells were transferred to a 24-well culture dish and expanded. Supernatants from these cultures were retested by ELISA for the presence of antibodies that bind to peptide Hex A.

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Using IgG-1-specific detection, the absorbance values obtained with the supernatants from hybridoma culture 02-101FE1, 02-101ED8 and 02-100JC10 were 2.150, 2.230 and 2.574, respectively, compared to an absorbance of 0.044 with buffer alone (Table 3). Absorbances were lower, but still positive, with gamma-specific detection (Table 3). Each of the cultures was expanded, cryopreserved and cloned by limiting dilution. Two-three clones of each culture were expanded and cryopreserved for future evaluation.

TABLE 3**Immunoassay of Supernatants from Anti-Hex A Hybridoma Supernatants**

		Detection With	Detection With
Culture ID	Dilution	Anti-Mouse IgG-1	Anti-Mouse Gamma
02-101FE1	2	2.150	0.941
02-101JC10	2	2.574	1.403
02-101ED8	2	2.238	1.174
Buffer		0.044	0.073

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EXAMPLE 2**Immunoassay for detection of antibodies reactive with peptide 29kDa**

The binding of mouse sera or MAbs to 29kDa was measured by immunoassay on wells coated with 29kDa. One hundred microliters of a 500 - 1000 ng/ml solution of 29kDa in PBS was distributed into replicate Nunc Maxisorp Stripwells and incubated overnight at room temperature. The unbound material was removed from the wells by washing four times with PBS-T. Unbound antigen was removed from the plate by washing four times with PBS-T. Antibody, diluted in PBS-T, was then added to the wells and incubated at room temperature for 30-60 minutes. After addition of the antibody, the wells were incubated at room temperature for 30-60 minutes in a draft-

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free environment. The wells were again washed four times with PBS-T and ninety-five microliters of detection antibody was then added to each well. The detection antibody was either peroxidase-labeled goat anti-mouse IgG (gamma-specific), diluted 1:10000 in PBS-T, or peroxidase-labeled rabbit anti-mouse IgG₁, diluted
5 1:6000 in PBS-T.

Following another 30-60 minute incubation at room temperature, the wells were washed four times with PBS-T and each well received 100 µl of TMB substrate solution (BioF_x #TMBW-0100-01). Plates were incubated in the dark at room temperature for 15 minutes and the binding reactions were stopped by the addition of
10 100 µl of TMB stop solution (BioF_x #STPR-0100-01). The absorbance of each well was measured at 450 nm using a Molecular Devices Vmax plate reader.

Isotype was determined using a mouse immunoglobulin isotype kit obtained from Zymed Laboratories (Cat. No. 90-6550).

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Immunoassay for detection of antibodies reactive with peptide 29kDa

The binding of mouse sera or MAbs to 29kDa was measured by immunoassay on wells coated with 29kDa. One hundred microliters of a 500 - 1000 ng/ml solution of 29kDa in PBS was distributed into replicate Nunc Maxisorp Stripwells and incubated
20 overnight at room temperature. The unbound material was removed from the wells by washing four times with PBS-T. Unbound antigen was removed from the plate by washing four times with PBS-T. Antibody, diluted in PBS-T, was then added to the wells and incubated at room temperature for 30-60 minutes. After addition of the antibody, the wells were incubated at room temperature for 30-60 minutes in a draft-
25 free environment. The wells were again washed four times with PBS-T and ninety-five microliters of detection antibody was then added to each well. The detection antibody was either peroxidase-labeled goat anti-mouse IgG (gamma-specific), diluted 1:10000 in PBS-T, or peroxidase-labeled rabbit anti-mouse IgG₁, diluted 1:6000 in PBS-T.

Following another 30-60 minute incubation at room temperature, the wells were washed four times with PBS-T and each well received 100 μ l of TMB substrate solution (BioF_x #TMBW-0100-01). Plates were incubated in the dark at room temperature for 15 minutes and the binding reactions were stopped by the addition of 100 μ l of TMB stop solution (BioF_x #STPR-0100-01). The absorbance of each well was measured at 450 nm using a Molecular Devices Vmax plate reader.

Isotype was determined using a mouse immunoglobulin isotype kit obtained from Zymed Laboratories (Cat. No. 90-6550).

10 **Immunization of Mice for Production of Monoclonal Antibodies Reactive with Peptide 29kDa**

Five female BALB/c mice, approximately 8 weeks of age, were immunized with 29kDa according to the schedule described in Table 1. All immunizations were administered subcutaneously in 50% RIBI adjuvant. Sera from the mice were tested by immunoassay, and based on the results of the assay described in Table 2, mouse 2028 was selected for hybridoma production. Mouse 2028 received a booster immunization of 50 μ g of 29kDa in PBS, administered intraperitoneally, three days prior to the production of hybridomas.

TABLE 4

**Immunization and Bleed Schedule for Production of
Monoclonal Antibodies Reactive with Peptide 29kDa**

Experimental		Boost			
Day		(ug/mouse)	Adjuvant		Bleed
0		10 ug	RIBI		Yes
34		10 ug	RIBI		Yes
48		None			Yes
60		20 ug	RIBI		Yes
74		None			Yes
98		20 ug	RIBI		Yes

TABLE 5

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Immunoassay of Day 98 Sera from Mice

Immunized with Peptide 29kDa

Mouse ID		Sera at 1:1000		Sera at 1:10000	
2026		0.260		0.078	
2027		1.415		0.306	
2028		2.184		0.383	
2029		0.838		0.107	
2030		1.073		0.154	
Buffer		0.061			

Preparation of Hybridomas Reactive with 29kDa Peptide

Hybridomas were prepared by the general methods of Shulman, Wilde and Kohler and Bartal and Hirshaut (34, 48). Mouse 2028 was selected for hybridoma production based on the results of an immunoassay and received a booster immunization of 50 ug of antigen three days prior to sacrifice. Spleenocytes from mouse 2028 were isolated and mixed with mouse myeloma cells P3X63Ag8.653 (ATCC Catalog number CRL 1580) at a ratio of 10 spleenocytes:1 myeloma. The cells were pelleted by centrifugation (400 X g, 10 minutes at room temperature) and washed in serum free medium. The supernatant was removed to near-dryness and fusion of the cell mixture was accomplished in a sterile 50 ml centrifuge conical by the addition of 1 ml of warm (37°C) polyethylene glycol (PEG; mw 1400; Boehringer Mannheim) over a period of 60-90 seconds. The PEG was diluted by slow addition of serum-free medium in successive volumes of 1, 2, 4, 8, 16 and 19 mls. The hybridoma cell suspension was gently resuspended into the medium and the cells pelleted by centrifugation (500 X g, 10 minutes at room temperature). The supernatant was removed and the cells resuspended in medium RPMI 1640, supplemented with 15% heat-inactivated fetal bovine serum, 0.05 mM hypoxanthine and 16 μ M thymidine (HT medium). One hundred μ l of the hybridoma cells were

planted into 952 wells of 96-well tissue culture plates. Eight wells (column 1 of plate A) received approximately 2.5×10^4 P3X63Ag8.653 cells in 100 μ l. The P3X63Ag8.653 cells served as a control for killing by the selection medium added 24 hours later.

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Twenty four hours after preparation of the hybridomas, 100 μ l of RPMI 1640, supplemented with 15% heat-inactivated fetal bovine serums, 0.1 mM hypoxanthine, 0.8 μ M aminopterin and 32 μ M thymidine (HAT medium) was added to each well.

Ninety-six hours after the preparation of the hybridomas, the P3X63Ag8.653 cells in plate A, column 1 appeared to be dead, indicating that the HAT selection medium had successfully killed the unfused P3X63Ag8.653 cells.

Ten days after the preparation of the hybridomas, supernatants from all wells were tested by ELISA for the presence of antibodies reactive with peptide 29kDa.. Based on the results of this preliminary assay, cells from 3 wells were transferred to a 24-well culture dish and expanded. Several days later, supernatants from these cultures were retested by ELISA for the presence of antibodies that bind to peptide 29kDa.

The absorbance values obtained with the supernatants from hybridoma cultures 02-100EC7, 02-100HH10 and 02-100FG5 are presented in Table 3. Based on these results, cultures 02-100EC7 and HH10 were expanded, cryopreserved and cloned by limiting dilution. Two-three clones of each culture were expanded and cryopreserved for future evaluation.

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TABLE 6

Immunoassay of Supernatants from Anti-29kDa Hybridomas

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Supernatants from T75 Culture Flasks

Culture ID	Culture Dilution	Detection With Anti-Mouse IgG-1	Detection With Anti-Mouse Gamma
02-100HH10	2	1.021	0.312
02-100EC7	2	0.687	0.230
02-100FG5	2	0.048	0.048
Buffer Alone		0.044	0.050

TABLE 7

LOCUS 1 (E8/B1/I16)
GATCCCGTTGTGCTTCACACCCGATAGATAGGGATTTACAGATAAATTCAGGTCTCTTCC
ACGTCATATTTGGACCCATCGAAAATTCGGGTTCTCAAATCATCGAACATAACAAAAGAA
GCTAAGCAACATGTAGGCCGTTGTCACTTAACCTCTTGTTTTCCGATGACAGCTTCTAT
TTAGAGAATGTCATGATTATTTTATATTCACTTCAATGTTATCAATATTAGTGCCATCTA
TGACATCTGCCATGCGATTTTCTTGTAATTTTTGTGCAATCAAACGTGTACTTTCCAC
CGTTTTTCATTTTAATAACAATTTTACCTGAACCAACGTTACCGTACAGATTATTTTTTT
CAATAAGTTGTTTTCTCAATTTAAAATCAAGTTCTTTCAAGGAAATCTGTTCTTTAGTAA
TCTTGAATTCGAAACATCATGAGAGATTGTACCTTTATTATCTTCCTTAGTAATCTTA
CTCCTGCTTTGTGATCAACTTTTTTACTATTACTCTTTGTGATACCACCGACAGAATATT
TTTCCAGATTGTAATTATTTTCTTCTAAAACGACAAATACATCGACATTCCATGTACTC
CTTCACCATATTTTTTATCATCTTTACCAACTAAAGCAATTTTATATATGAAATAATCTG
GGACAACATTCATAAATCTTATTGTGCTCCATTTTTTTAAAATAATACCAATCTCATTTT
TAAATCTAAACTTGGTTTCGTATAATACGCTCTTAAATCTTTAAATTTAGGATTTATTT
CTGTTGGTACTTGTGTTTGTGGTTGGCGATTGTGGTGTGTCTGATTTAGTAGATTGCATTG
GTTGTGGCGTGTGTTGTTGATGGAGGTGTTGTCACTTTAGTTGAAGGCGGTGTTGTGCGCAT
TTGCTGTTTGTGCGGTGCTTCTACTTTAGTTGAGGGCGGTGTTGTGCGGTTTGGTTTTG
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AAGATAGTGTGTGCGGTTTGCTGCTTGCGTTGTGCTTGTGATTACACCTGTTGTTAAAA
GGCCTAGTGCTAAACTTGTTTTAGCAATCGTTGTTATTTTCATAGTTGTATGCTCCATTC
GTAATTATTAGATTGTTTCGATTACATTCATTGAATCATACAGCTTTATTATAGATGGCG
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TTGAAGTTTCGTCACTTTTAAAGACATAGAAATGCCACTTTTACAAACAAATGAATATTCTG
TCTTTTTACATCATTACGCATAATAAAAAGAAGCTAAGCAACATGTAAACCGTTGTCACTT
AACTTCTTGTTTTTCCGATGACAGCTTCTATTTAGAGAATGTCATGATTATTTTATATTC
ACTTCAATGTTATCAATATTAGTGCCATCTATGACGTCTGCCATACGATGCTCTTGCACT
TTTTTGTGTAATTCAAACGTATATTTCCACCGTTTTTCATTTTAAATAACGATTGTTCCCT
GAACCCATGTTACCGTAAAGATTATGTTTTTCAATAAGTTGTTTTCTCAATTTAAAATCA
AGCTCTTTCAAGGAAATCTCTTCCTTAGTAATCATGTATTCTGAAACATCGCGTGAAATC
ATACCTTGATTATCTTTTTTAGTAATGCTTAATCTACTTTGTGATTAACTTTTTTACTA
TTAGTCTTCGTGATGCCACCGACAGAATATTTTTCAATTGATATTTATTGTCTTCTAAA
ACGATAAATACATCGATATTATCGTAAGGTCCATCTTATATTTTTTCTCATCTTTTCCA

ACTAAAGCTATTTTATAGATGAACCTATTTGGAATAACATTCATAAACCTAACCGTCGTC
CATGGTTTGAGCATAAATCCAAACTGCTTTTCAAATTCAAAACCTCGGTTTTGTATAATAC
GCTCTTAAATCTTCATATTTAGGAGTCATATCTGTTTGTGCTTGTTTTATGGTTGGAGAT
TGTGGTGTGTCTGATTAGTAGATTGCATTGGTTGTGGCGTGTTTGTGATGGAGGTGTT
GTCACTTTAGTTTTTCGGCGTTGTGGATTGGTTGTCGTTTGTGATTGTTCTTGTTTAGGC
GCTGGCGTTGCTGATATATTAAGCGTTTTCTGCTCTTCTTGTTTAGGTTGTGATATTTTT
TCTATTTTGAAGCTGAGGTTTTTTCCTCATTAGTATTTGGTGCCTTTTCGAGTTTAGGC
GTGCGTTCTTGTCTTGTGTTAGCTGCTTGTGTTGTCGCTGAATTTGCACCTGCTGTTATG
TTTATCATGCTAATCGCTCTGCTTTAAGCGTTGGTACTTTGTCAACTTTAGTTGATTGT
ATTTTTCTGCTTTGACCGATTGCGTCGTTACTGTAATTGCGCCTGTTGTTAAAGCCCT
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AAAAATAATGAGTGAGTATGAGATTAATATAGCGTTTCTATGTGCCCTTTGAAATAATTTT
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CAACTATTTTCGTATCAAGTATATGTGTTATGCTTTTATAACTTTGATTTCAATCTAT
CAATATCTGTGACATTGATAACATCGGACATACGGTCTTCTTGTAACTTTTTATCCAATT
CAAATGTATCTTCCATAGTATTTCTTTTGTACTGTAATTTTTCTGTACTCAATTCAC
CGTAAAGACCATAATTATCAATAAGGTATTTTCTTAATTTAAATCAATCTCTTTCAATG
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CTTCTTTAATAACTCTTGCTTCTGCTATTAGGTCGACAGCTTTATCGTTTGCACCTCGTGA
TACCCCAATAGAGTACTTTGCACCTTCAAATCTCTTATCCTCATTAACGTAAATATAT
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TATAACCTGTCACATTTTATATTCAATACTAGGTTGATTATAATAAGCTTTTAATTTTT
TGCTATTTCACTTATTACAATAGGTTTCTTTTCGGCATGAACTGGTTTTTCCGTTGTAG
TGTTTACACCTGTTGCTAATATTCCTAATAACAACTTATTTTTGCAATATTTTTCAATTT
TCATAGTTGTATGCTCCAATCTATTATAATTAGATTGTTTTATTACGTAATTTGAATCAT
ACACCCATATTATAGGAGCTGTATTCGGATATTCACATTAACCTGTTTTTAACTATTTCAT
AAAAATATGATTAAGCTATTTAAGCAAAAGATC
LOCUS 2 (B10/I15)
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CCTGCTATTGTCCAACCAAAAAACAGCAATAACAAAAACAGGCAATGCTCAAGTAAGTCAA
AAAGTTGATACTGCACAAGTAAATGGTGACACTCGTGCTAATCAATCAGCGACTACAAAT
AATACGCAGCCTGTTGCAAAAGTCAACAAGCACTACAGCACCTAAAACTAACACTAATGTT
ACAAATGCTGGTTATAGTTTAGTTGATGATGAAGATGATAATTAGAAAAATCAATTAAT
CCAGAATTAATTAAATCAGCTGCTAAACCTGCAGCTCTTGAAACGCAATATAAAACCGCA
GCACCTAAAGCTGCAACTACATCAGCACCTAAAGCTAAACTGAAGCGACACCTAAAGTA
ACTACTTTTAGCGCTTCAGCACAAACCAAGATCAGTTGCTGCAACACCAAAAAACGAGTTTG
CCAAAATATAAAACCACAAGTAAACTCTTCAATTAACGATTACATTTGTAAAAATACTTA
AAAGCACCTAAAATTGAAGAAGATTATACATCTTACTTCCCTAAATACGCATACCGTAAC
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AATGGTGAAATTAGTTATATGAAAAATAACTATCAAAACGCATTCGTACATGCATTTGTT
GATGGGGATCGTATAATCGAAAACAGCACCAACGGATTACTTATCTTGGGGTGTGCGTGCA
GTCGGTAACCTAGATTTCATCAATGTTGAAATCGTACACACACACGACTATGCTTCATTT
GCACGTTCAATGAATAACTATGCTGACTATGCAGCTACACAATTACAATATTATGGTTTA
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AGTTATGATCAATTATATGACTTAATTAATGAAAAATATTTAATAAAAAATGGGTAAAGTG
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TCGAAACCATCAACTGGTAAATTAACAGTTGCTGCAACAATGGTGTGCGCACAAATCAAA

CCAACAAATAGTGGTTTATATACTACTGTATACGACAAAACCTGGTAAAGCAACTAATGAA
GTTCAAAAAACATTTGCTGTATCTAAAACAGCTACATTAGGTAATCAAAAATTCTATCTT
GTTCAAGATTACAATTCTGGTAATAAATTTGGTTGGGTTAAAGAAGGCGATGTGGTTTAC
AACACAGCTAAATCACCTGTAAATGTAAATCAATCATATTCAATCAAACCTGGTACGAAA
CTTTATACAGTACCTTGGGGTACATCTAAACAAGTTGCTGGTAGTGTGTCTGGCTCTGGA
AACCAAACATTTAAGGCTTCAAAGCAACAACAAATTGATAAATCAATTTATTTATATGGC
TCTGTGAATGGTAAATCTGGTTGGGTAAGTAAAGCATATTTAGTTGATACTGCTAAACCT
ACGCCTACACCAACACCTAAGCCATCAACACCTACAACAAATAATAAATTAACAGTTTCA
TCATTAAACGGTGTGCTCAAATTAATGCTAAAAACAATGGCTTATTCACACTACAGTTTAT
GACAAAACCTGGTAAGCCAACGAAAGAAGTTCAAAAAACATTTGCTGTAACAAAAGAAGCA
AGTTTAGGTGGAACAAATTCTACTTAGTTAAAGATTACAATAGTCCAACCTTAATTGGT
TGGGTTAAACAAGGTGACGTTATTTATAACAATGCAAAATCACCTGTAAATGTAATGCAA
ACATATACAGTAAACACAGGCACTAAATTATATTCAGTACCTTGGGGCACTTATAAACAA
GAAGCTGGTGCAGTTTCTGGTACAGGTAACCAAACCTTTTAAAGCGACTAAGCAACAACAA
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AAAGCTTATACGTGTACTAAACCACAAACGACTCAAACAGTTAGCAAGATTGCTCAAGTT
AAACCAAACAACACTGGTATTCTGTGCTTCTGTTTATGAAAAACAGCGAAAAACGGTGCG
AAATATGCAGACCGTACGTTCTATGTAACAAAAGAGCGTGCTCATGGTAATGAAACGTAT
GTATTATTAACAATACAAGCCATAACATCCATTAGGTTGGTTCAATGTAAAAGACTTA
AATGTTCAAAACCTTAGGCAAAGAAGTTAAACGACTCAAAAATATACTGTTAATAAATCA
AATAACGGCTTATCAATGGTTCCTTGGGGTACTAAAAACCAAGTCATTTTAACAGGCAAT
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LOCUS 5 (L4)
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LOCUS 7 (D3)

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LOCUS 8 (D4)
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LOCUS 9A (D22)
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LOCUS 9B (I2)
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C

LOCUS 9C (J13)
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LOCUS 9D (M11)
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LOCUS 9E (M13)
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LOCUS 10 (D9)
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LOCUS 11 (D10)
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LOCUS 12 ()
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LOCUS 13 (D18)
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LOCUS 14 (D21)
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LOCUS 15 (I1)
GATCCTGAAACGTAATTAATTGAAACTGTAGAACCCTCAGTCACCTTGTGTCTTTTCTA
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LOCUS 17 (I3)
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LOCUS 18 (15)
GATCGTTTTAAATGTTCAATATATTCCGCTGCACTTTGCGCTGCAATACTACCATCGCCAG
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GATC
LOCUS 19 (I8)
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LOCUS 20 (J7/M10)
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LOCUS 21 (G3)
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LOCUS 22 (I19)
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LOCUS 24 (L10)
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LOCUS25 (HA4)
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LOCUS 26 (L19) :
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LOCUS 27A (A2)
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LOCUS 27B (A5)
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LOCUS 27C (A7)
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LOCUS 29 (A) N10
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LOCUS 29 (B) GE2
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LOCUS 30 (N15)
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LOCUS 31
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LOCUS 32A (HE9)

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LOCUS 32B (P9)

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LOCUS 33 (014)
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LOCUS 34 (018)
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LOCUS 35A (P13)
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LOCUS 35B (P15)
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LOCUS 36 (P5)

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LOCUS 37 (P8)
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TCACTGTAAAAATTTGCCGCCATAAATGTGTACCACCTTTGATTAGGGTCAAATGTAGTCT
TTTCTAACTTGAAATTACTTGCCGTAACCTTTATCATTTACATTTGTACCTTTAGCATCAG
CAGCATTTACTACCGGTTAGCAACAGCTAAACTACGTACAGCTCTCGTTCTAACACTTG
GTTTACTAGTTCCTTGCGCATTGGAAATCGTTTGTGGTGATGATTGTGGTAAATCTAATG
TTTGAGAATTTTAAAGCTCACTGTTTGTGCTATGCTATTAGCATCATTCGTTGTTTAT
TATCTACTTGAGAATTTGCTTCTTGAGGAACAGTTTGATCTTGCAATTTTGCAGCAGTTG
CTTGATTTTTAATTGCCGTCGGTTGAGGTGTTTCATTTGTTGAAGCTGGCTCTGTTGTAG
TGGTATTGCTCGTTTGTGTAGACATTGGTTTTGTTGTGCTATCTACATTCGCACTGTTTG
TGTTTGCACATAATATCAGATGTATCATTAGCCGTTGTATTTAATTGAGGTGTTTCTATCA
TATTGTTTTTTTCGGAATCTGCACCTGCATTATTTTTTCGAAGATTGCGTTGTATCGTTCTG
ATTGTTCTGAAGCTTGTGCTTGATGATTGCCTATCCCAAATAGTATAGTTGCCCTACTA
TTACTGATGTGGTACCTACTGTAAAACGTCTAATCGAATACTTATTCTGCTTATTCGACA
AATAATCAATTCTTTTTTCAAAAAATATTACTCCATTTCAATTTCTAGATTAGTCTAAAT
TGTATAATGAAATAAGAATTATATCAATTGCTTTTCGAAAAAATTACGTAAAATTTGTT
TTCTTCTATTATATAACTTAAATTTTCTGTAACTAGCAAAAAATCAATATACTATTT
TTACACTATTACAAATTTTTTACTTTTCAAAAACTTAGAAGTTCTAAATTTTTTCATCACC
TTAAATTTTACTGTAATTTCAACAATCAAATTTAACTAACATTTTAAATTATTTCATCATG
CTAGCAAAAAAGGCCATAACGTATAAATGTACGTTAGACCTCATGTTCAACTTATTCAATTT
TACATTGTATATTAAACACATACATCATTTGAATAAATGTTTGCTTACTAACCAATTTTTA
TGATC
LOCUS 38 (P16)
GATCAGCTAACGCTACAAAATAATAACAAATGCGATGATGATTAATACTAATTTACCTG
CTGCTAATACAGAATCTCCAAGGAATGAGAAGAATGGTTGACGTTCAACTTCATTGTTTT
TAAGACTGTAAATAATATCTTCTTTCTCTTCAACACTTACTGGATTCAACAAGCATGACA
CAATAATCGCGTTAACGATATTTAGTGGAATTGCCGTTAGTACCAGTTCTCCTGGTACCA
TTTGTACATACGCACCTACAATAGCTCCCGATACAGAGCTCATTGACATCATTGCGATTG
TTAATACACGCATTTTCAATTCATACGTTTTAGTTGCTCACTTGATACGGCTAATGCTTCAG
TATTTCTTAAGAATCATTTTCTATCCCAAAGAATGACTCGAATTTAGGTTGTCTTGTTA
CTTTAGCTAGTAACCAACCAATACCTCCAATAATTTTCGGTAAATATTAAAGTACATTA
AGATATCAAATAATGGCACTATTAATAATATTGGGAATAAGGCTGCAACAGCCATATCCA
TCATTTTAAACATTTGTCAAACCTTGCAAATGCAAAACCTGTACCAGCATGCGCTGACTGAA
CTACCCAAGCGATACCATTTGGCTGCTCCTCTTACTGCTTTTTTGACCCCAATCAAAATAAA
TAAAGAACCATGCTAAAAACAGGTTTAAAAACAATAAGATC
LOCUS 39 (HB3)
GATCTTTGAAATTTGTTTCTTCAAAAGTTTTTGATGAAAAGTTAATTTTTCTGGAAGAAC
ATAACTGTTGTGCCATATATCCAAAACCTTTCTTGATATTTTTTAAATTTATCGAAATTAA
TCACGGAAAATCCCTCCATAGAAATTTCTATTATAAATTTCTTGACCAGTTTTCCCTGAA
CCTACTGCAACGCCACAGCCTTACAGTTATCTCCAAATGCTCGCGCGCGTAATTGTAT
CCTGTACTACCTTGTGCGTGATACGTATCTAAATAGGTTTCTTTGTGTGATGTTGGAATA
ACAAATCGATCTTCATATTTGGCTAGTCTAATAAACGATACATGTCTTTAGTTTGGCGC
TCGGTTATACCTAATCGCTCTAATCGAGACGTGTCAAATGGCTGTTGAGTAACTTGAGAT
CTCATATAACTTCTCATATTGCCATACGTTGTAGGGCTCCTTTTACTGGCTCTGTATCT
CCTGCAGTGAAATATTAGCTAAGTATTCAATAGGTAAACGCATTTCTTCAATGGCTGGG
AAAATCGCATCTGGATTTTGTGTTGATTTTTACCTTCAAATAGCTCATAATTGGGCTA
AGTGGTGGGCAATACCAACCATCGGCATCGTTCTAAATTCAGGATGTAACGGAAATGCA
AGTTTATATTCAATTGCTAACTTATAAATTGGAGAGTTTTGTGCAGCTTCAATCCAATCG
TAACCAATACCATCTTTTTTCAGCTTGAGCAATGACTTCTTCGTCAAATGGGTTTAAAGAT
ATATCTAATTGTTTTTTCATATAAATCTTCTCGTCTACTGCTGAAGCTGCTTCATGAAT

CGATCTGCATCATATAATAAAACACCTAAGTAACGCATACGTCCTGTACAAGTTTCAGAG
CATACCGTAGGCATACCCGCCCTCGATTCTCGGGAAACAGAAAGTACACTTTTCAGCTTTG
TTCTGTTTCCAATTGAAGTAAACTTTCTTATATGGACAACCTGTCTATACAGTAACGCCAT
CCACGACATGCGTCTTGGTCAACTAATAACAATGCCATCTTCATCACGTTTATACATAGCA
CCTGAAGGACACGATGCAACGCAACTTGGATTCAAGCAATGTTACATAAACGTTGGTAAA
TACATCATAAAAGTTTCGTCAAATTGGAATTTAATATCTTCTTCTATTTTTTGGATGTTA
GGATCTTTTGGACCTGTAACATGACCACCTGCTAAGTCATCTTCCCAGTTAGGTCCCCAT
TCAATTTCAATGTTATCCCCGTAATTTCTGAATACGCTCTAGCAACTGGCGAATGCTTC
CCTGATTTTCGCAGTTGTTAAATGTTTATAATTATAGTTCCATGGCTCATAATAATCTTTA
ATTAATGGCATATCTGGGTTATAAAAAATTTTACCTAAAGCAATTTTGGAAATCTACTT
CCAGATTTTAATTCAAGTTTCCCTTTACGATTTAGTACCCAACCACCTTTGTAGTGTCT
TGGTCTTCCCAACGTTTCGGATACCCTACACCTGGCTTCGTTTCTACGTTGTTGAACCAC
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CATCCTATGCATTATCTAAATTTAATACCATCGCAACTGCGCTTTAATCTTCAAGCCA
ATTAACCTCCTTCATCTTCTAAGTCTACATATAAATCCCTTTGGTTCCCAATTGGTCC
ATAATAATTAAAGTGATAACTAATTTGTGCGTATCCTCCGACTAGTTGTGTTGGTTCAA
ATGGATTCTAGTCGGCGCGTTGTGTGAACCACCACGTGTATCTGTAATTTCTGACCCAGG
CGTTTGAATATGTTTATCTTGTGCATGATACATAAACATTGTACCTTTAGGCATACGATG
CGAAATAACTGCTCTTGGCGTTACAACACCATTACGGTTATACACTTCTAGCCAATCATT
ATCTTGGATATCGTGTTTTTCAGCATCTTCATTTGATATCCAAACCGTTGGACCACCTCT
AAATAGTGTCAACATATGCTTATTATCTTGATACATTGAGTGTATATTCCATTTTCCATG
AGGCGTTAAATAACGCAGTACCAAAGCATCTGTACCACCTTTAATTTTCTATCTCTATT
CCCAAATACCATTGGCGGCAATGTGCGTTTATATACTGGTAAGCTCTCCCAAATTGTTG
GAAAACTTCGTGATC
LOCUS 40 (HB5)
GATTCATCAATACTTTTGAAACACCACCTAATGATGCAATGTCTTGTGTTGGGAGTCACCTA
AGTGTCCGGAATGATAGATAACAATATTACCTGTTTCACGTTTTAAAATAAAAGATTTAA
ATAGAAATCGATTATCAAAAGGCAGTTCCGAAGTAGGTGTCGCATATAAGTTTTTGTGA
TGGATTCTAAACTGTCATGTAATTTGGACTGTTTATTTTTAAATTGATTAGTCATTTTAT
TTTCATCCTTCGATTAATTTGAATTGTACATACGCAGTACCCTTTATTTAATTTAATAATC
AATGAGAGTCTTTCAAACCTTCGATTTAGAATATGCTTCATACAATAAATAAGTACTTGGGA
GCACTAAAAAATTAAATCTTTTAGTACAACATTAATGAAAACCTAAAAGTTTCATCCTACA
ATGCTACTAAAAAAGGGGAATGGAACAGAAATGATATTTTCACAAAATTCATTTTCGTCTG
TCCCAGACCCGCTTTGAATTATAAATTATCGTCTTGTTCTTCTTCTGATACTTGAACGAT
TCGCAATGAACGACGTTCAACTTCTTTAATTTTTCAGCACGCGTTTCAAGTTAATTCT
ATCGCGCCCTAAAATGATTAAAAATGATATCATCATGAAAATAAAAAATAACAATTAATGG
CACACTTGGCAGTATTGAAGCAGTTTTCAATACTTCTAATGCACGTTCAACCAACTAG
CATCAATGAAAATGGCAATAAGCACAATGCAAAATGCCAGAATAAACGATTGGCAGGTAA
TGGTTCGCCTACCACCTTTTTTCTGAGATGCTGCCGCTAAAATATATGAACCCGAATCAAA
TGTTGTTGCTAAGAATAAGAAAGCAGATACTAAGAATAGTACAATCATCAATGATGGGAA
TGGTAAATGATGCACCACTTCAATAATGGTTGCCTCTGTACCATGTGTATTTAAATATTG
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GAATAATACGCATCCAAGCGTTCCATAAATAATTGTTCTTAGCACGACTTCTTTAAGGCG
TCGACCTTTTGAAATTCTAGCGATAAATAAACCGATAAATGGCGCATATACTAACCACCA
TGACCAGTAGAATATTGTCCAGTCTTGTGGGAAATTCGTTTCTTTTCGACCTTTAATACC
ACCGAATGGTTCTAACCATGTTGCCATATGAAAGAAATCTCTCAACATATTTCCGAACCC
TGTCACTGTCGTTTCCATAATAAAAACAGTCGGTCCAATAATAAATATAAAGGCTAAAAG
TACAAAGGATAGCCAAACGTTGATATCACTTAACTTTTGAATACCTTTTTTCAATCCTGT
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ATTTTTACCATCTAAACCAGTTAATCTTTCATATGCTGCAGAAATTAATGGCACACCTAA
CGCTAGTGATGTTGCCGCACCACCTAGCAATCCAAAGATAAATAAGATATCTACAACCTT

ACCTACAAATTTATCTGTTTGACCTTTTAAAAATCGGACGACAAGCTTGACTAATTTTATA
CACCGGTTGTTTTTTAAACAAATACTAAATAACCAATTGGTAATGCTGGTAGAACATAAAAT
AGCCCAAGCAATTGGCCCCAGTGGAAACATACCATATTGCGTCGCATATTGGAGTGCTTC
ATCACTCATACTTTTCGCGCCATTGGTGGAACCTTGATAGTAAAAAGCCCATTCATAAC
GCCCCAGTATAAAATATCAGAGCCTATGCCTGCACAAAACAGCATTGCCGCCCATGTAAA
TGTATTAAATTCTGGTTTATCACTTGCTTTACCAAGTGTGACATTACCATATTTACCAA
TGCGATATACATTACAAAGCAAAAAATCGCCAGCCCCATAAAATAAATATATCGAACCAAT
TGAATCAGAAATGGCACTATTAATACCAGTGATGATATCTTCACTTGCTTTTGGAAAAGC
CATCATAGGTATAACTGCAAAAAAGAGTACAGCTACTGTCCCTATAAAGGTCGTCCAGTC
CATAACTTTCTCTTTTTTCAATTGTGCTCCCCCTAATTATTAATTTTATGAATCCTGTTT
CGATTTATCTCAAAATGTAATAATTATATTGATTACAAAATTGACAATAACTAACATTT
AATAATAATGCAAATTTATACAATTTGAAACTTGGCAATTATTGAATATTTATATAATT
TTTCCCGTAATAAAACAAAACCTTAATAGCGCTAAAATAACAGTGTTAAGTTACGATTTAA
CGAATTTAAACAAATTTTACTAGAATGGCATTTAAGAATATTTATACGTTATTAACGAATA
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CAACTAATATATATTCAATCATACGCGCATGCGAGAGTGATTGTTGTACATCTATAATG
CGTTGATTTAAAGAACCTTTATATGGTAAATCAGGTTTGAATAAGTGTGTGTATAAATAGA
CCATCTACTAAACGTCATGTATGATAATACTCTCGACGTTCTGTACAATCATTGCT
AAATATTATATAAAAAATCCAGTCCATACCCAAATTGTCTTTGTATTTCCAAAACGTGCT
CGAAATGCTTTGACAAGATTTAATGTAATATCCAAATTACAAAATGGTTCGCGACCTAAT
AGACTTAGCCAGATATATAATCATGATCGCAATCATCTAATATTTCTGCTAATATTCA
TCAGTGTATTTCTCGCCATATCTGAACCTTTGTGAGGCTTTGTTATAACATCCAACACAA
TTAAATGGACATCCTGATACATAAACACTGCATCTTACTCCTTCACCGTCAACAAAGCTA
TTTGATTCTATTTTAGCAATATAACCTTGTCTTGTGTTAATGTCTAAAAGTATCATTCTT
TAGGCGCTTTTATATGTTTTACTCGTGCAGCAATTTCTTTATGACGGCCTTTAATTACTG
GACGTTGAACTGGATTGCCTAGGTAACCACATGTTTCGTTTAAACGACATCAACTGTTTTAG
GATTATCATTGCCACAGTTCGGGCATTTAAATCCTTTTTTCAGTTGCTTCAAAATCTCCAT
CGTAATCACATTATAACAATGATC
LOCUS 41 (HB7)
GATCTACATTATATTGCTCAAATAAAGGCGATAATACTTTAGGATTTGGCTTCTCATAGG
CATCCGCTTCGGTAGAAATGATCAAATCGAACACGAGGTAGCATTGGTATGTGCTAAAA
ATTGTTCTACACCTTTTTTAGTATCACTCGTAACAATACCAAGTTGATAGCCTTTTGCTT
TCAAATCGATAAGTGCTTCTTTAACACCTTCTACCCAATTAATTTCAGGAATACGTTTCT
CTACCAGCTTTTGACTTGTGACTTGGACCACTCGGTTGTATCTTGTCCCGTCACATCAT
TAAATGCCTGGATAATTTGTTGTAAAGATCCTGAACCCATCACTGATTTTGGATCAATAG
ATTCTTTAATGACACCGAGTTGTCTTAAAGCAGCTTCTTTATTATGTACTGGGAAAGTCT
CAAGCAATGATTGTACAAATCGTACCCCTATTTTTTCCCAACTTCTATCAAATTCAATTA
ACGTACCATCTTTATCAAATAATATCCATTCCATTGATATCAATACTCCTATTTATTTAT
TTTCGTATTATGCTGATTCTATGATATTCGTTATCCCCCTGAAAATGAACTCGTAGTATTGT
TCTATTTAAATATTGAATTAATATAATAATAAGTGAATCCCCTTCAATACTTAACAAT
AAACATTGTAACTTAATTTATTACCATGCTTCGTTTCATTGAAAGGGATTTTAGTCATG
ATTAACCTTTTGCATATTGTTTTCATGATTATATTCAATTTTTTATTAATATTTTGGTACAA
CGACTCTCCAACCATTTTTATCTTCTAAAGTACCATTTTGAATACCAGTATAGACGTCGT
ATAATTTTTGAGTAATTTACCAGTCTCATTATTATTAATAACGATTTACAGATCTTCGT
ATCTCAATGTACCCACAGGTGAAATAACTGCTGCAGTACCCTACCAAATACTTCTGTTA
ACTCACCTTTATCATATGATTTCGAATAATTCATCGATTGAAACGCGGCGCTCTTCGACTT
CATATCCTAAGTTTTTAGCTAATTCGATAATAGATTTACGTGTAATACCAGGTAATAATAC
TGCCATTCAACTCTGGTGTAAATTAATTTGCCATTTTCAACGAAGAAAATGTTTCATGCTAC

CAACTTCTTCGATATATTTCTGTTCAACACCATCAAGCCATAATACTTGGTCATAACCTA
ATTTATTTGTCATTAGTTTGTGCTAATAAACTTGCCGCATAGTTACCTGCAACTTTTGCAA
AGCCTACACCGCCACGAACAGCACGCACATATTCATCTTCTACATAGATTTTAGTTGGTT
TTAAAGTTTCACCACCATAATATGCACCTGAAGGAGATAAAATAATTAATAATTTATACT
GATGTGATGCACCAACGCCAAGTGCCCTTCTGTTGCAAAAACAAATGGACGAATATATA
ATGATTGACCTTCCCCTTCAGGAATCCAATCTCTTTCAATATCAACTAATTGTTTTAGCC
CCTCTAACAATTCTGCTTCGTCTACTTGAGGCATTTCTAATCGTGCTAACGAGTTATTAA
GACGCTTAAAATTTTCTTCAGGACGGAAAAGTGCAACTTCCCCATCTCTTTTATATGCTT
TTAATCCTTCGAATACCGATTGACCATAATGAACACCTTGTGCAGCAGGTGAAATTTCAA
TAGGACCATAAGGTACTATCTTCAAATCATGCCATCCTTTATCTGCATCATAATCATAAC
TCAACATATAATCAGTAAAATATTTACCAAAACCTAGTTGAGATGTATTTGGTTTTTGT
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ATTGTATAAGAATTTGTTTAACTTAAATTATAACAATCCATATTTTGCTGTTCAACAAAT
TTTCTAAAATTCAAAATTAATTAACAGATTTCTAGAAAGACTATATCTTTTAGTATAAA
CGTATTAATTTACAGAGACAAGTAATCTGTGTTTTACTAATACTTTACATACAAAAA
ACTCTTTACTTTAAAATGAACTAAGCTCGCGAATTCATAAGTATAATGAATAATATTAG
AATTCATGCACTAGTTTATTAAAAATAAGAGTAATTTAAAAATATCATTCCGTGTATTAA
GTGAATGGAAATGATTAGTTATTATTTTAAACAGTATCTTTTGTTCATAGCTTCTAAC
ATTAATTTAGTCATGCTCGCTAAATCATATTTAGGATC
LOCUS 42 (HB8)
ACGGACTAATATTTCAACTTCCACATTAAAGACACGTTTAATCAACGAATAAATACGTC
TGCCGTTGTTGCATTTTCCGTTTGAACATTTATAACAAATTGTTGATTTGAAAGACTAAG
TGCACCATTCAATCGAATCAGTGCACTGAGCTCTGCTTTTGCATTCAATTCATCGACGTC
TATTCTAGTTAATTCATTTTTCTGATGCAAAGCTCATCGTACAGTCATTCCTTTC
TTATTTAAAACATGATTCACCTTAGAACCCTGTCTATTTTCAATTTTTTACAGCTCTA
TTATCATATCATAATATGATTACGTTCTATATTATTACGTTTATCACTTGGTACGAAAG
GAATAGTACTAATTAATTTCTAAAGCTATGTCATAAATCATTGTGATAACACTTTAGTAT
TATGTCTTACTAAATGATTTTCAGAAATTTCAACTAAATTTGAAGATGTTTTACATTTA
TGCTTTCTTTTTCAAGTTTCAAGCTTATTAACCTCAACTGGTTTAGAATGTTTTCTTCAT
ATTTTTTCAAACTTGAGCATTGAAAGTTTGTGTAATAAATGACATAATCAATAAACG
GTTGTCCAGCTTGTCTATGAATCGCATCGATATGATCTTTCACGCTATAACCATCTGTTT
CCCCAGGTTGCGTCATCACATTAGAAACATATAGCTTAGGCGCATCAGAATGAATTAACG
CATCTGAAATACCATTACACATAAGTTAGAAATAACGCTCGTATATAATGACCCTGGTC
CAAGAACGATTAAATCTGCTTCCCTTAAAGCATCGATTGCTTCTTCCATTGGTTGCACAT
CGTTAGGTTCTAAAACACACGATCAATTTTTTATGTTTTTAGGAATATTTGTTTCTC
CAAAAACAATTTCTCATCTTCCATAACAGCATTTAATTGCACACTGTATTGTAGATG
GAATGACTCTACCTTTAATATTTAAAATTTACTTAATGCTTTAATGGCATGTCCGAAT
CATTTCGTAATATTAGTCATACCTGCGATTAATAAATTACCTAATGAGTGACCGCTAATTT
GATTTTCTTCAAAGCGATACTGAAAAGTTGGCTTAAAACCTGACTCAGAATCACTTAAAG
CTGCAATCACATTTCTGATGTCTCCTGGTGGTATATCCATTTCTCTGATTTTCC
CTGTACTCCCACCATTTATCAGCAACTGTTACAATCGCCGTAATATCAATTGGGAATTCTC
TTAATCCCCTAGCCATAACTGATAAGCCAGTGCCACCACCGATAAGTACAACCTTTATTT
GTCTCATTTTTTCTGCCACTTTCAATATGTGCGTCCCTATGATGCACATAAACATTATA
TTCAAATACTTCATTTAGATAATTACCTAGTCGTTCTGCTAATGCTACAGATCGATGTTG
TCCACCCGTACAACCGATGGCAATTACTAATTGAGATTTCCCTTCTTTTTTATACCCGGG
TATCATAAAATCTAACAAATCAGTTAATTTTTCAAAGAAAATCTCCGTCTCTTCCATTT
CATAACATAATTATAAACGCTTTTATCTAATCCTGTTAAAGGCTTAAATCTACTACATA
ATATGGATTTGGTAAAAATCGTACATCAAATACTAAATCTGCATCCATCTGAATCCCATG
TTTAAACCGAACTTGTGACATTAATTGTAAAAGTTTCAAACCTTTCATCTTCATAGTA
TCGACGAATGCGTTCTTTTAATCTTTAGGTGATAACTTTGTAGTATCTATAACAAATTT
AGCTATACTTCTAATTTGAGACAAATGCTCTCGCTCATCATTAAATGCATTGATTAAACGA

TC
LOCUS 43 (HB10)
GATCAACTCATTGCAAAATACGATTTATAGACATCAAAGAATCAATACATTGTAAAGGGG
ATGTTGCCCATGAAAGAAGTTGGATTTGGCACACTAAACTGGGTTGCCGTTATCATTTAT
CTACTAGCTATGTTGTTTCATTGGCGTTTATTTTACCAAGCGCGAGCCAAAGTACCAAT
AGTTTCTTTACCGCAAGTGGTCGCTTGCCATCTTGGGTAGTTGGCTTTTCAATTTATGCT
ACTACGTTAAGTGCGATTACATTTATGTCGACACCAGAGAAAGCATTTTTAAACAGATTGG
TCATATATCGCTGGTAACATTGCTATCGTCGCAATTATTCCATTACTTATTTATTTCTAT
GTCCCTTTCTTTAAAAAGTTAAAGGTAACATCTGCATATGAATATTTAGAAGCTAGATTT
GGCCCTAGCATACGTGTCATTGGCTCATTATTATTTGTCGTTTACCATTTAGGGCGTGTT
GCAATGTTATCTACTTACCAACATTAGCAATCACATCTGTATCAGACATGAACCCTTAT
ATCGTGCATCACTCGTTGGTTTACTATGTATTTTATATACATTTTATAGGTGGTTTCGAA
GGTGTGGTTTGGAGTGATTTTCATTCAAGGCGTCATTTTATTAGGCGGCGCTTTAGTTATT
ATTATTTCTAGGTGTTGTGAACATTAAGGCGGTTTTCGGCACTGTCTTTGCAGATGCGATT
GAGCAGAAAAAATTAATTAGTGCAGACAAATTGGAAGTAAATACTGCGGCAGCTGCCATT
CCAATTATTTTCTAGGAAATATTTTCAACAACCTGTATCAATACACAGCGAGTCAAGAC
GTCGTGCAGCGTTATCAAGCTTCTGATAGTTTAAAAAGAAACAAATAAATCGTTATGGACA
AATGGTATCCTAGCTTTAATTTTCAACACCTTATTTTATGGTATGGGTACAATGCTGTAT
TCATTTTATACACATGAAGCTGTTTTACCAAAAGGCTTCAATACATCATCTGTAGTGCCA
TATTTTCAATTTGACTGAGATGCCACCATTTGTAGCAGGATTACTTATTGCAGCCATTTTC
GCCGCTGCACAGTCTACCATTTTCACTAGTTTAAATTTCTATATCTGCTTGATTTTCAATC
GACATTAAGCAACGCTTCTTCGAAAAAGGTAGCGAGCGACACGAAGTTAAGTTTGCACGT
TTTCAATTATTATCATTGCAGGTATTTTCGGTTTTGGAATGTCACTATACCTTAATTGCTTCT
AATTCAAATGACTTATGGGATTATTTCTTGTGTTGTGACTGGATTATTCGGCGTTCCATTG
GCTGGTGTATTTGCAGTTGGTATTTTCACTAAACGTACGAATACATTTCGGTGTATTTGT
GGATTAATATTGGGTATCATCTTTGCTTATGTCTATAATGGTGTGGCAAAGGTAACCTCA
CCTTTCTATGTATCTACCATTTTCAATTTACAGTTGCTTTTGTCTTTGCTTATATACTTAGC
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TGTTTATCACTAATGCCTTTAATTGAACCTACGATGATACCAACCGTACCAAAATTAGCG
AAGCTTACTAAGTAACTGAAATGATACCTTGTGTTTCGAGCTGATACATCAACCCAGGACA
TTTTTAAATCAAGCATTGCTACAACTCATTGTGAATTAATTTAGTCGCCATTAAAGAG
CCAGCTGGAACAGCTTCGCTCCATGGAATCCCCATTAGAATGCGATTGGTGCAAACACA
TAGCCAATAAGCTGTTTAAAGTTCAAACCACTACCAACATGATATTAATTGCTTCC
ATTAATGAAATAAATGCTAACAACATTACGGCTACTACAACAGCGATTTTAAACCCATCC
ATCGCACTATACCAATCATTTGGAAAAAGGCAACTTTCTTAGGTTTTCTGTTTTTCCA
TTCAATGTTTTAGTTTTCTGTGGATTTTCGTTAAGTTATCAATTTCAACATCAGTATCATCA
GATTTATAGGGATTGATTACACTGGCGATGATAAGCGCACTAAAAATATTTAACATTACT
GCTGTAACCTACGAACCTGGGTTCAATCATCTGCATATATGAACCTAGCATTGCCATACTA
ACAGCACTCATACCAGACGTGCAATTGTATATAATTTGCTCTAGATAATCTTGGAATA
ATATCTTTTATTGTTAAATATACTTCTGGTTGCCCAAACATTGCTGTTGAAATAGCAAAA
TAACCTTTCTAAGCGCCCCATTCTAGTTATTTTATTAATAGCGATACCTACATATTTGATA
ATAAATGGTAATACCTTAATATAATTAAGATGCCTATTAATACAGAAATAAAAACTAAT
GGCAGTAATACGTTTTAAAAAGAACGTAAAGCCATTTTTATTTTGTATATCTCCAAAAACA
AAATTTATGCCTGCTTTACTA
LOCUS 44 (HD7)

TCCACTCTCTTCGTTGAATCCAAGATTAACGATTGGCAAACAAATTACAGAAGTAATATT
TCAACATAAACGTGTATCTAAATCTGAAGCAAAGTCGATGACAATAGACATTTTAGAAAA
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TATGCGTCAACGTGTCATGATAGCAATGGCATTGATTTTAAAGCCACAAATTTTAATCGC
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GTATCAATTTTTCGACGATGTGATTGTAATGAAAGATGGAAGTGTGTTGAAAGTGGCAC
GGTTGAAAGTATTTTAAATCGCCACAACATACCTATACAAAACGCTTAATAGATGCGAT
TCCTGATATTTCATCAAACGCGTCCGCCAAGACCGTTAAACAATGATATTTTATTAAATT
CGATCGCGTGAGCGTGGATTACACATCACCGAGTGGCAGCCTATACCGAGCAGTTAATGA
TATTAACCTGGCTATTAGAAAAGGCGAAACATTAGGCATTGTGCGTGAATCAGGGTCAGG
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GTATAACGAATTACCATTAAAGTTTATTTAAAGATGATGAATTGAAATCTTTACGACAAGA
GATACAAATGATTTTCAAGATCCATTGCGATCTATTAATCCAAGATTTAAAGTCATTGA
TGTGATTAAACGACCACTAATCATTCATGGGAAAGTCAAAGATAATGATGACATTATTA
AACTGTCGTATCGTTGTTAGAAAAGGTTGGCTTAGATCAAACCTTTCTATATCGCTATCC
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ACCTAAAGTGATTGTTTTCGACGAGGCAGTGTCCGCTTTAGACGTTTCAATTCAAAAAGA
TATCATCGAGTTATTAACAATACAGTTAGACTTCGGCATCACTTATTTATTCATCAC
ACATGACATGGGTGTTATCAATGAAATATGTGATC
LOCUS 45 (HD9)
GATCTGAAGTAGCTCGATTTTAAATAGTTTTCAGCAATGACATCGTCTTTTTCTGTGCGC
GTATTCGGTACCATAACTACTTTTGTACCTTTATTAACACACCTTTACTGTCAAATACG
ACCTCACCAACACCTTCATGAATTAAAGACATTGGCAATTTCTGAGATAAGACATTCTCA
TCACGGCTACCAGTATAATATCTTTGATC
LOCUS 46 (HE9)
GATCAGATAGATAAAGTATTTTCTTTTTATTATGTTTATCAGAATATGCGCCACCGAAAA
TACCAAATATAATAAATGGAAGTGTGTTGACTCATAACCATCATTGATAATTTTAAAGATG
ATTGGTTTGTCAATTCAACAGTAAACCAAATTATTTGTAACGAAAACAGCACAAAACAAC
TCCGACGTAAGAAATTACCAATCAATAAATATGTAAAGTTTCTATTTTCAAACTTCTA
AATACAACATATTTATCACCTCTCATAAAAATAATTGAATGCATCCACCAGCTTTTTTAG
ACCTTCTTCTAAACTCTCTTTATCCAAGCGCAATTAATTCTAATATAATTTAGTCAGTT
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LOCUS 49 (A) B13
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LOCUS 50 (A) GB2
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LOCUS 50 (B) G10

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ATGGTCGACATGCGGTTTGAAGTTGATGTACTTAGCGAATCACTTAATGATGCTGATGT
CTTTGTGAATCGGATTCA
LOCUS 52 (E1)
CAGGATTCGTTTTATCTAACTCTTCCCCAAAAGCTGATAAGTGTGTGTAGTTTGTGTTG
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ATCCGCGTAAATTTTGTAAATAAATCGGTAATAAAATCATAACCACCATATAAACTTAACA
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CTTCCATACCATCTAATTTGGCAATTGTACCTTTTGGAGGCATT
LOCUS 53 (E20)
CATACTTCTATGTCTGGTTCCTTGATTAAATAGCTCATAAATATCAAATGCTGGTGATTCT
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TCCTAACATTAATTTGATCTACTTGATGTCCTTGTTCAATAAGCTTATCTTTTAAAGCAT
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LOCUS 54 (E105)
CAGTAATTAATAAAATTTTGTGCATCGAACATAATTATCTCCCTTTTGGCATTGGCATAG
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ACCTCATCTTTATTTCATAAGCTCTTCAAACATTTTTTCGCCGGGTCTAATCCCTGTATAA
GTAATGCGTATGTCGTCTTCTTTTTTACCACCTAGCTTAATTAAATTACGTGCCAAATCT
ACAATTTTCACTGGTTCTCCCATATCTAGCACAAATACTTCGCCACCTTCTGCTAATGCC
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GATCCTCTCGATCCAAGTACATTACCAAATCTCACTGCAACAAAATTTGTTTCGATGCGTT
TCATCATTTTAACTTTGAATAATCATTTCTGCAATTCGCTTTGAAGCTCCCATGACATTA
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LOCUS 55 (E18)
ATCAAAAAGTTATGATGAACGTTTTACGCCGGATGAAGTAGTCGCATACCAACAACATCA
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AACAAAAGTGTTAACGATGGGGTTCATAGATGATTGCTATATCCGGATGATC
LOCUS 56 (F5)
AACATACAGGTAAAGTTTTACTTGTAAGTGAAGATAATTTAGAAGGTAGTATTATGTCAG
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LOCUS 57 (F3)
GATCTTCGCGTCTTAATGGATGCCATATACGAACTGAATGACCACCAAGATTGCGTGAG
ATTACTAAAGATTGAAAATGCAAAAACCTCGCATTAGCAGGATTCCCTAAAAAGATAAAA
GGTACGTACATTGAGTCATTATTTAAAGAACACAAATTGTTATAACGAAAACCATTAATA
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TTATTTTCGTTGTTCCACTCTCATGATTTTTTTGATGAAACATAATTACATGATTGATTGC

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ATTACCATTTGTAGCAGGTTTAGCATGGATTGTTACAAAGCTTGTCCCAGGTAAAGATAT
TGCTGATGACTATAAACCTCAGCACTTA
LOCUS 58 (G8)
GATCCAAATCACTTGTTTGATTGGTTTATTCTTATTAGACTGTTGATGAATTCGATTTA
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LOCUS 59 (G23)
CTTGTAATTCCTTGTTGGTTAAATATGGATGTACCTCAATTTGATTACCATTTGGTTTGA
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CTATGTATCTTTTATATCTTTACATTACCCTAAATTTTTCAACAAACTCAATTAATACGA
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LOCUS 60 (G29)
TCTTCTGAGAAGGTTTTTGACCCATTTGCATCATCATCATACGAAGCATTTCTTCGTTGA
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AGGTGATCTTCTGCTAAAGCTAATCCTACTGACATAGCAAAACCTTGTCCAAGTGGTCCG
GTAGTAACCTTCTACACCATCTGTATGTCTGTATTGAGGATGACCTGGTGTTTTAGAACCC
CATTGTCTAAATTGCTTTAATTCTTCTAATTCTAAACTACCAGAAACATGTAACAAGCTA
TACAATAATGCTGAACCATGCCCTGCAGATAATACGAAACGGTCTCTATTGAAGTAATCT
TTAGATTGTGGATTAAAATTCAGATGACGTGTCCACAAAGTGTAAGCCATTGGGGCAGCT
CCCATAGGTAATCCTGGATGACCAGAATTCGCTTTTTTCGATTGTGTCGATACTTAGTGCA
CGTAGCGTATCAACAGCTAATTGATC
LOCUS 61A (HA7)
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ACAATTTGAATCCTACTGGTTTTTGACCTAATTGCTGCAACTGATC
LOCUS 61B (G28)
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LOCUS 62 (H3)
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LOCUS 63 (GD10)
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GGAGTTTATCA
LOCUS 64 (F5)
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LOCUS 65 (F110)
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LOCUS 66 (E1)
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LOCUS 67 (F119)
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LOCUS 68 (G27)
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LOCUS 69 (H110)
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LOCUS 70 E100
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LOCUS 71
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LOCUS 72
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LOCUS 73
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LOCUS 74
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LOCUS 75
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LOCUS 76
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LOCUS 77
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LOCUS 79
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LOCUS 80
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LOCUS 81
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LOCUS 83
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LOCUS 94 HA2
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LOCUS 95 HA5
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LOCUS 98 GE2
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LOCUS 99 GE3
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LOCUS 102 (GF9)
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CTATTGCATT

LOCUS 103 (GF11)
GATCATTTCATTTTAAAGCCAGACTTTTTATAATCTTGTACAAATGCTTGCGCTACATCCT TGTGTTGATCAAGCAATTCCTCTCAGTACTAGCACACAGCAATACGCATCAGGTATAA CGTCATCACCATGTTTCAAAGTCTTACCTTTGCCTAACTTTTACCCAGTGACCCGAATG GTTCCGGCTACAGAATACCCTGTAATTCTGTGTTCACTCAATGCGGCTGGCATTCTTGCTG GCGACATTTTCATGATAGCTAAAATGCCCGGTTTAACTTTTAAATTGTTTACGTAATTCCT CAAGTAAAAGATAATGTGTTGAATAACGATGTGGTATACCAAAATGGTAATCATCGCCAT TATTATTAAATTCATTTAAGTGCATACCTTTTTGTCCCATAATGACATTGCCTTCATGAT GGCCCAATGCCACAGCCTTTATATTTGAGCCCTTCTGTTTTGATTTCATCGCTAGCTCTA TTAAAGTTGATGCACCATCAATACGACCACTGTTTAAATGCGTCCATTAAATCTGGCCAAT TATTGAATTTAACTAATTCTAGTTTATATTTCCGATGATTGTATTGTGATAATAATTTT TAGTCATCATCAAATTAGCTGAATGTGTAATCGGCAAATATCCAATTTTAAATCACTTGCT GATTTTGGGCATTTTAGACCGTTCTTTAGACGTCCTTGCCAATCACATCCTGTAATTA TAAAGATTCCAATGATGACGATTATGCTTAACCTTTTCATCGTCACTCACTCCTATAAA TAATATTTCAGGTTCAACTTGATGATGATTCAATGCAAATGTTTCCATAATTTCAATACGA ATCTTAAGTAGGTGGCTATCATTACGACTGCGTGGATGTGATGCTGTAATTTCAATTTGA GAAATAATATTGCACCTTCACCTAACAGAACAATGCGGTGCGAAAGATAAAATAGCTTCA TCAATGTCATGCGTCACTAAAATAATAGTTGATTGCGTTTTATGTTTTAGTTGCACTAGT TGATCCTGAAGTTTATAACGTGTAAATGCATCTAATGCACCTAATGGCTCATCCATCAAT ATAACGTTAGGCTTATGCACATGCGCTCGACATAGTGCCACACGTTGTTTCATACCCCG GACAGTTGCTCGGGAAAATGCTTTCCCTGTCTTCTAAATCACTAATTTAAGCTGTGCG TTAATCTCTTCATCACTAATTTCTGTGTGTAATCCAATCCTAATGTGTGTCATTAATCGTT TTCCATGGCAGCAAATTATGATGTGAAATAGCATTAAACAATCTGGAGATGGCTGTGTG TTAATTTCTGTTATCAATAATGACACGACGACGATGGATGAATAAATCCACCGATAATA TTGAGTAAAGTAGACTTTCCGCAACCACTTTTCCCTATGAAAGTGACTATTTCTCCCTTG CTAATGTCCAAATTAAAGTTATGAATTACTTTATGTGATC
LOCUS 104 (GF12)
GATCGCCGATAAGTAAAAACGGTGCATTTCATACGTTTCATCATATAATATCCTTCGAAAC CTTCCGCTGTTTCGATAACCACTAAAATATACGTTTAGTGGCGGTTTCATATCACCAGGGT GGAAATAATAAATAAATTCTGTGTTGACTATCTACGAAACGACTACCACCAAGTAAAA ATTGACCCATGTCTAATCTAGACCATCGTTTGTGTATAGGTCTTAAATGTACCGTCCCGT TCCCACGCGCCTTAACAGTTACACTTATATAAGCATCAAATGGTTTCGACGGTATCTCTA AAGGACTGTCTAACATATCATCAGTCAATACGATTTGTTCAATTAATGCACCATCAGCGC CAGTCTGAATCAATCTAAATGTATATTGCAACTCGACCGCACCATCAATATCAAATCTG GCCATATTTGAATGACTTTATCTTTATCGTAAACGAGATTATTTTGCCAAGATGCGATAG GTTTAAATTTCTTTCCAAATTCTCCACTCAATGTGAGCTCTGAATTACCTTGGTAAACGA CATCTCCTTTAAAATTTCGGATGCACAAGTGCTAACTTAGGAGAAACCTTATCTCCATACT GTCCTGAGAAGCTAACTGCCTCTAATTTATTATTACGTTCTTCAATATTCCGGTAATGTA ATGGTTGAACAACGTATTTTTGGACATTTTCGTCTTGTTTCATATTCAACTGACCAAAATG ATTCATCAACATACGTATTGTATGGTTGCTTATCATTTGTAATAAATTCGTTAATGTCT CCGAGTATGGTGCTTGAATATAGATAAAATCAAAGCGCCCTTCTGCTTCAACAATCGCTT CAATAGCCTCTACATAACCACTATCAAATTCAAACAATCCAATATCGAAGTAATCCCAAC TCACACCTTTTTTGTGTTGAAAAATAGGTTCTAAATCGTCTCCTCCAATTTGCAAACTC TAAATTTACGTGGCATCATTTTACCTTCTATTAATCATCGAGCTGATTAATAATATTC TTAGAAGCATATGCATCTATTAATTTTAAAGAATAGGCGTACGCATAATTCCAATTTTTC AAATAAAATAAATAAATAATTTAACGCATCATCTAATTCATCAACTGTATTTATAATACGG CCATTGTCATAATCAGAGACGTAATCTGTTTGTGACCATTAAATTTGTGGAATCCAGCG CTAATTGCACTAATTTGTAAATACAAGTCAGGTTCTTTTGACATATCTATCACAAGTCGC AACGTCCGCAATGCTTCTACAACATCATGTTTCAGCATGTATCGTCTTAACAGCAATGATG TCATCTTGATC

LOCUS 105 (E18)
ATCAAAAAGTTATGATGAACGTTTTACGCCGGATGAAGTAGTCGCATACCAACAACATCA AGGTAATAAATTTAAAGAACATTTTGATTTGAATTGTTATCTGACACTGCTAGATGTATT GGATAGTCACAACATTGACCGAGGTGCGACAGACGTAACGCATGTTTTTAAAAATTTAGA AACAAAAGTGTTAACGATGGGGTTCATAGATGATTTGCTATATCCGGATGATC
LOCUS 106 (E101)
CTTCTAACATATTAACCCACTCGTTTGTTAGCAGCGTTAAAACCAACACCCGGCTCTGCGT TTTTCAAACGTTCTACAATAACAGAACCTTCTAATCCTGCATTTTCAGCAATTTGACGAA CTGGTGCAGTTAATGCTTTAAGTACAATATTTACACCTGTTTCAATGTCACCTTCAGCTT CAATTTCACTTACTTTTTGGTAAACATTTACTAATGCAGTACCACCACCTGCAACAATAC CTTCTTCAACTGCTGCACGTGTAGAATTTAATGCATCTTCAATACGTAATTTACGTTCTT TAAGCTCTGTTTCACTTGCTGCACCTACTTTGATAACTGCAACACCACCTGCTAATTTAG CTAAGCGCTCTTGTAATTTTTACGATC
LCOUS 107 (E110)
CGATATCTCCAAATTGTCTAATCAAGACCATTGTACACCTTGCTTATCATTCTTTTTAT CACTTAGCATATATTGGTATAACGTTTCAAATCCAAGTCAGTTATCATGTCTAAAGGAT AGCCGAGTTGTATTAAATATTGAATATAATGATTAATATCATGCTTAGAATCAAACAAAG CATTCGCAACTATAAATTGATAGATAATGCCAACCATCACTGCATGACCATGAGGTATTT TATGATAGTATTCAACAGCATGACCAAATGTATGACCTAAATTTAAAAATTTACGTACAC CTTGTTCTTTTTCATCTGCAATAACAATATCCAGCTTCGTTTCAATACCTTTAGCAATAT ATTTATCCATACCATTAAATGACTGTAATATCTCTATCTTTAAAGTGCTGTTTCGATAT CTTGCGTCGCTGATTCACCATTCAATAACGCATGCTTATAAACTTCTGCATAGCCACTTA ATATTTGCTCAAATGGTAACGCTTTTAAAAAGACTAAATCATAAATCACAGCAGTTGGAC GATAAAATGCACCGATAAGGTTTTTACCTTGCTTTGAGTTAATACCCACTTTACCGCCAA CACTAGAATCATGCGCTAGTATAGTCGTTGGCACTTGTATAAAGTGCACGCTTCGTAAAA GTGTCGCCGCAATAAAACCCAGCAAAATCACCAGTTGCACCACCACCAACAGCAATAATTG CTGTATTACGAGTTACATGATGGGATAAAATATACTCTAATGTTTCTTGATATTGCTCAA ATGTTTTCTGCTTTTTACCAGCTGGAATAATACTTTATGTACATTTTCATATGATAAAA TATCATCAAATTTATCAGCAAAATATTGATTTACATGCTCGTCAATTAATATAAACTTT GATCAAATGATCAATATACGTGCTAATATGGTCAATTGCACC
LOCUS 108 (E125)
CACTTTTGAATGTTCACTTCTAAAGATTTGGTCTGTAACCTCCATTTAGCTAATCCATA TTTTTCATAAATTTCTTGTCATAAAGTGATTTGTATCATGGAATGCTGGTAAACAATG TAAGAATATCGTTGAATCTTTACCTGTAAATCAAACATCTGTTGATTCACCTGATAGTC TTTTAATAAATTAATACGTTGTTCAAATTCACCTTTCTTACCCATCGATACCCAAACATC TGTATATATAGCATCTGTATTTTCAACTGCTTCTGCAATATTATCCGTAATCATGACTGA ACCACCATATTGACTCGCTTTTTCTTTTGCAATATCAACATATGCCTCTTTGGATTAA TGATTTAGGTGTACAAATTCTTACATTAACACCTAACATAGCACCTGCTACCATTAAATGA ATGCGCAATATTATTACGTCCATCTCCAACGTAAGTTAAGTTTATTCTTCTAGATATCC AAAATTCTCTTTTATTGTACATAAAATCAGCTAACATTTGTGTAGGATGCCAATCGTCTGT TAATCCATTCCACACCGGTACACCAGAGAACTTCGCTAAATCTTCAACAGCTTGTTGTGA AAAACCACGGAATTCAATACCATCGAACATTCTACCTAATACTTTTCGAGTATCCTCTAC AGATTCTTTTTGCCTAATTGAATATCATTTTTTCTTAAAAATTTCTGGATGCGCACCTAA

ATCAATAGACGCAACTGTAAACGACGACGCGTTCTCGTCGAATTCTTTTCGAATAGTAG
TGCAATATTTTTTCCAGATAAGTAGTGATGCTTAATACCGTTTTTCTTATACTCTTTTAA
TGTAATTGCAAAATCAATAAGTCCTTCGAATTCTGCTTTGGTAAATCACTTTCTTTTAA
TAATGATCTGCCTTTTAAATCATACGGTTTTTGAATTTCTGTCAATTATTTTACCCTCGT
TTCTATAATTTATTACGTTAAATGTCTCTCTGAATAATGGTTGACTCATACATCTAGGG
CCCCACGTCCACGTACCAACTCGCTACCAGATATTTCAATGACTTTAATGCCTTTTGT
CTCAATAAATCATTCGATACATAGTTTCTATCGTAAGTCACTACAACGCCCTGGTCTTATA
CATAATGTATTTGAGCCATCATTCATTTGCTCTCTAGCACCATCAATGACATCACCATT
CCTGTTGGAATGAATTGGATATCATCTATACCTAGTACGTCTTCTAAAGTATCTTTTAAA
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TGTGCAGATGTACGTTCTGAAACGCTATAGCCAAGACATCTTAGATAAAAACAAGTTCA
TCGCCGCTTCAATATTGAATGGGCAATCTCGATC
LOCUS 109 (F101)
CAATACCTTGTGGACAAATAAGTATGACATCTTGATTATCTACATTAAAGTAATCTGGGC
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CTTTCAATCGTGCGATCATCTGACTCGCATGTCTGTTGCCAATGATTATCTCGATGATTTT
CTGTGTACATATAATATAAATGCCCCGTATATTCAAAAGCGCTACCGCTATATACACCAT
GGCTGTCAATTTTAGTATCTGGATTTAAAATTGGCCCTTCAGCTTTAAAGTTTATTAAGT
CATCACTCGTGTAGTTATACCAATACTTTAAGCCATGTACTGCGCCTAATGGGAACCATT
GATGTGAAACATAATACTTCCCTTTATAAAAAATAAGTCCGTTGGGGTCATTTAATAAGC
CTGTTTCTGGTTGTATATGAAATTGTTGACGAAATTTTGATTGATCAACTTGTGTTTTA
ATGTTTTAAAATACTCAGTATCAACGTCCTCGATTGTTGATAACGTTCTTCTCTAGTCC
ATTCGGTCATAATATTTACCCAGTCCTCCTTTTATAATTTATGCTGTTAACAATTTATAT
TCTATTATAGCAAATTTTACCTACGTTCTTTAACTTTTAACTATCCATTATAGTTATA
TGGTATCGGTTCCACATTTATTTTAAAAAATACAGCGTCTAAATATTAACATCTACTGTG
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GGGTCAACCACCAAAACCATATATTTGATGTGGTTTCATAACATCTTTTTTATCAGAATAA
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 ATACCATTCCACTGTACCTAATTCGTGTATCATAATTATTTCTCCTTTTCCAATCACTT
 TTATTTGATC

LOCUS 110

GTCTCTTTCAACAACCGCGTCATATTTTTCAACATAACCTTTTTTGATAAGTCCATCTAA
 ACTGGATTTTGAAAAGCCCATATCCTCAATATCAGTTAAAAATATTGTTTTATGTTGTTT
 TTCAGACAAGTAAGCATACAAATCGTATTGTTTAAATAACTTTCTCCAACCTTAGCTAATAC
 TTCATCAGGATGATACCCTTCAATGACACGAACAGCAGCTTGGTTTTTTTAGTTATATT
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 TTTAATAGCACTCGGAAGCATCACTTCTAGCATAGAAATACGTTTAAATGACATGAGTTGA
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 TTCTATGATTTTTTTTAACTTCGAAACGTCAAGTTGTGCATCAGGTTCTGCTGTTACTTC
 CATTACATAACCTTGAATCGTTCTTGGTCCAAAAGGTACAATTACACGCACACCAGTTG
 GATGACAGATTGAGTTGTTTCGGGAATTATATAATCAAATTTATAGTCAACGCTCTTCGA
 CGCGACATCGACTATGACTTTCGCTATCATTATTGCCAC

LOCUS 111

GCGTTGTGAATTAGTATAATCAATTTACTGGAAGATATTTAGTCGATTGATACCTATCAA
 CTATTTTCAGCATACGATAAATTATAACAAATCATAGTTTATTATCACACTTAATTATTA
 TATTTTTCAAGGGAGAATACGAAATATGCCTAAAAATAAAATTTTAAATTTATTTGCTATC
 AACTACGCTCGTATTACCTACTTTAGTTTTCACCTACCGCTTATGCTGATACACCTCAAAA
 AGATACTACAGCTAAGACAACATCTCATGATTCAAAAAATCTAATGACGATGAACTTC
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CAATAACGACAAAAAATTTAAAACTATAGACGACAGCACTTCAGACTCTAACAATATCAT
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TCCAAACTATGCTAAGAAATTAACAGTATTATTAAACACTATCAATTAACCTCAGTTTGA
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ATCAGATGAATTCAAACCTTTCCGTGAGGTATCTGATAGTATGCCATATCCACATGGCCA
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AGGTGATGCACATAATTGGAATAATCGAGCTCAATACCGTGATTATCAAGTAAGTCATAC
ACCAAAACGTGATGCTGCTGTTGTATTGAGGCTGGACAATTTGGTGCAGATCAACATTA
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AAAGTCATGTTTATCATCTGA
LOCUS 112
ATAATATTTAAGCCTACACTAGCTAACATACCAATCATAGAAACCATTGGTGCCCCAATT
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CGTATGACCTTG
LOCUS 113
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CTTAATTTTAAAGCAAAGGCAATGATGCGCTAATTAGTTATAGATATATCATAGGCTGCT
AGTTAACATCTGCCACTATTACAAAGTTATATTTTCAAGATTTTCGAAACACAAATATTT
AATTATTTGGAGGAATTTATTATGACAACAGTTTAT
LOCUS 114
GCGCACCAAACCTCTCGTCCAATTGATTTTGAAATGAAAAAGAAAGATGGAACCTCAACAGT
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ACCATGTGAGAATCGTTGATAAAGAAGCATTACAAAAGCCAATACCGATAAATCTAACA
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CGCCTGCTACAAAACCAACTAAAGGTGAAGTAGAATCAAGTAGTACAACCTCCAAC TAAGG
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LOCUS 115
GGATCTGATATTTTATCAATGTGCTTGTCTATCTTTTTTAATATCATCTAACGTTTCTTA
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TABLE 8

LOCUS 1 (E8/B1/I16)
>G1832 STAAU8325, UNDEFINED PRODUCT 1724158:1725096 REVERSE MW:34671 MEHTTMKITTIAKTSLALGLLTGVIITTTTQAAANATTLSSSTKVEAPQSTPPSTKIEAPQS KPNATTPPSTKVEAPQQTANATTPPSTKVTPPSTNTPQPMQSTKSDTPQSPTTKQVPTE INPKFKDLRAYYTKPSLEFKNEIGIILKKWTTIRFMNVVPDYFIYKIALVKGDDKKYGE VHRNVDFVLEENNYNLEKYSVGGITKSNSSKKVDHKAGVRITKEDNKGITISHDVSEFKI TKEQISLKELDFKLRLKQLIEKNLYGNVSGSKIVIKMKNGGKYTFELHKKLQENRMADVI DGTNIDNIEVNIK
>G1834 STAAU8325, UNDEFINED PRODUCT 1725193:1725327 REVERSE MW:5264 MFVKVAFPLCLKSDETSNVPSVESHQNHFYLTNIMDFLIYLTMIQI
>G1835 STAAU8325, UNDEFINED PRODUCT 1725449:1726531 REVERSE MW:40775 MEHTIMKMRTIAKTSLALGLLTGAIITVTTQSVKAEKIQSTKVDKVPTLKAERLAMINIT AGANSATTQAAANTRQERTPKLEKAPNTNEEKTSASKIEKISQPKQEEQKTLNISATPAPK QEQSQTTESTTPKTKVTPPSTNTPQPMQSTKSDTPQSPTIKQAQDTMTPKYEDLRAY TKPSFEFEKQFGFMLKPWTTVRFMNVIPNRFIYKIALVKGDEKKYKDGPDNIDVFIVLE DNKYQLKKYSVGGITKTNSSKKVNHKVELSITKKDNQGMISRDVSEYMITKEEISLKELDF KLRLKQLIEKHNLYGNMGS GTIVIKMKNGGKYTFELHKKLQEHMADVIDGTNIDNIEVNI K
>G1837 STAAU8325, UNDEFINED PRODUCT 1726810:1727562 REVERSE MW:28926 MYDSNYVIKQSNYNRLEHTTMKMKNIAKISLLLGILATGVNTTTEKPVHAEKKPIVISEN SKKLKAYYNQPSIEYKNVTGYISFIQPSIKFMNIIDGNSVNNIALIGKDKQHYHTGVHRN LNIFYVNEDKRFEGAKYSIGGITSANDKAVDLIAEARVIKEDHTGEYDYDFPFKIDKEA MSLKEIDFKLRKYLIDNYGLYGEMSTGKITVKKKKYGYKYTFELDKKLQEDRMSDVINVTD IDRIEIKVIKA
LOCUS 2 (B10/I15)
>G0678 STAAU8325, UNDEFINED PRODUCT 661503:665291 FORWARD MW:138168 MLGVINRMMAKKFNYKLPSMVALTLVGS AVTAHQVQAAETTQDQTTNKNVLD SNKVKATTE QAKAEVKNPTQNI SGTQVYQDPAIVQPKTANNKTGNAQVSQKVDTAQVNGDTRANQSATT NNTQPVAKSTSTTAPKTNTNVTNAGYSLVDEDDNSENQINPELIKSAAKPAALETQYKT AAPKAATTSAPKAKTEATPKVTTFSASAQPRSVAAATPKTSLPKYKPQVNSSINDYICKNN LKAPKIEEDYTSYFPKYAYRNGVGRPEGIVVHDTANDRSTINGEISYMKNNYQNAFVHAF VDGDRIIETAPTDYLSWGVGAVGNPRFINVEIVHTHDYASFARSMNNYADYAATQLQYYG LKPDSA EYDGN GTVWTHYAVSKYLGGTDHADPHGYLRSHNYSYDQLYDLIN EKYLKMGK VAPWGTQSTTTPTTPSKPTTPSKPSTGKLTVAANNGVAQIKPTNSGLYTTVYDKTGKATN EVQKTFAVSKTATLGNQKFYLVQDYNSGNKFGWVKEGDVVYNTAKSPVNVNQSYSIKPGT KLYTVPWGT SKQVAGSVSGSNQTFKASKQQIDKSIYLYG SVNGKSGWVSKAYLVDTAK PTPTPTPKPSTPTTNNKLTVSSSLNGVAQINAKNGLFTTVYDKTGKPTKEVQKTFAVTKE ASLGGNKFYLVKDYNSTPLIGVWKQGDVIYNNAKSPVNVMTYTVKPGTKLYSVPWGTYK QEAGAVSGTGNQTFKATKQQQIDKSIYLFGTVNGKSGWVSKAYLAVPAAPPKKAVAQPKTA VKAYTVTKPQTQTTSKIAQVKPNNTGIRASVYEKTAKNGAKYADRTFYVTKERAHGNET YVLLNNTSHNIPLGWFNVKDLNVQNLGKEVKTTQKYTVNKSNNGLSMVPWGTKNQVILTG NNIAQGTFFNATKQVSVGKDVLYGTINNRTGWVNAKDLTAPTAVKPPTSAAKDYNITYVI KNGNGYYYVTPNSDTAKYSLKAFNEQPFVAVVKEQVINGQTWYYGKLSNGKLAWIKSTDLA

KELIKYNOTGMTLNQVAQIQAGLQYKPQVQVRVPGKWTDAKFNDVKHAMDTKRLAQDPALK YQFLRLDQPQNISIDKINQFLKGKGVLENQGAAFNKAQMYGINEVYLISHALLETGNGT SQLAKGADVNNKVVNTSNTKYHNVFGIAAYDNDPLREGIKYAKQAGWDTVSKAIVGGAK FIGNSYVKAGQNTLYKMRWNPAPGTHQYATDVDWANINAKI IKGYDDKIGEVGKYFDIP QYK
LOCUS 3
>G1419 STAAU8325, UNDEFINED PRODUCT 1379120:1380817 FORWARD MW:61188 DRKPVTVADLKVEGALAMILKDAIKPNLVQSIEGTPALVHGGPFANIAHGCNSILATETA RDLADIVVTEAGFGSDLGAEKFMIDIKAREAGFDPAAVVVVATIRALKMHGGVAKDNLKEE NVEAVKAGIVNLERHVNNIKKFGVEPVVAINAFIHDTDAEVEYVKSWARENNVRIALTEV WEKGGKGGVDLANEVLEVIDQPNSEKPLYLELEPLEQKIEKIVTEIYGGSKVTFSSKAQK QLKQFKENGWDNYPVCMAKTQYSFSDQTLGAPSGFEITIRELEAKTGAGFIVALTGAI MTMPGLPKKPAALNMDVTDDGHAIGLF
>G1420 STAAU8325, UNDEFINED PRODUCT 1381154:1383838 FORWARD MW:100947 MNKHHPKLRSFYRSIRKSTLGVASVIVSTLFLITSQHQAQAAENTNTSDKISENQNNNATT TQPPKDTNQTQPATQANTAKNYPAADESLKDAIKDPALENKEHDIGPREQVNFQLLDKN NETQYYHFFSIKDPADVYYTKKKAELVDINTASTWKKFEVYENNQKLPVRLVSYSVPVE DHAYIRFPVSDGTQELKIVSSTQIDDGEETNYDYTKLVFAKPIYNDPSLVKSDTNDAVVT NDQSSSVASNOTNTNTSNQNIISTINNANNQPOATTNMSQPAQPKSSTNADQASSQPAHET NSNGNTNDKTNESSNQSDVNQYPPADESLQDAIKNPAIIDKEHTADNWRPIDFQMKNDK GERQFYHYASTVEPATVIFTKTGPPIELGLKTASTWKKFEVYEGDKKLPELVSYSDSKD YAYIRFPVSNGTREVKIVSSIEYGENIHEDYDYLTMVFAQPIITNNPDDYVDEETYNLQKL LAPYHKAKTLEQVYELEKLQEKLEPKYKAEEKKLDQTRVELADQVKSATVEFENVTPPT NDQLTDLQEAHFVVFESSEENSESVMDGFVEHPFYATLNGQKYVVMKTKDDSYWKDLIVE GKRVTTVSKDPKNNRSLIFPYIPDKAVYNAIVKVVVANIGYEGQYHVRIINQDINTKDD DTSQNNSTSEPLNVQTGQEGKVADTDVAENSSTATNPKDASDKADVIEPESDVVKDADNNI DKDVQHDVDHLSMDSDNNHFDKYDLKEMDTQIAKOTDRNVDKDADNSVGMSSNVDTDKDS NKNKDKVIQLNHIADKNNHTGKAALKDQVQYNNNTDKVTDKKTTEHLPDIDHKTVDKTV KTKEKAGTPSKENKLSQSKMLPKTGETTSSQSWWGLYALLGMLALFIPKFRKESK
>G1421 STAAU8325, UNDEFINED PRODUCT 1383972:1384061 FORWARD MW:3459 MKIILLFLIFGFIVVVTLKSEHQLTLFSI
LOCUS 4 (E103)
>G2652 STAAU8325, UNDEFINED PRODUCT 2537955:2540798 REVERSE MW:104512 LHLRENIIVKSNLRYGIRKHKLGAASVFLGTMIVVGMGQEKAAASEQNNTTVEESGSSA TESKASETQTTTNNVNTIDETQSYSATSTEQPSQSTQVTTEEAPKTVQAPKVETSRLDLP SEKVADKETTGTQVDIAQPSNVSEIKPRMKRSTDVTAVAEKEVVEETKATGTDVNTKVEV EEGSEIVGHKQDNTNVNPNHAERVTLKYKWKFGGEGIKAGDYFDFTLSDNVETHGISTLRK VPEIKSTDGQVMATGEIIGERKVRVYTFKEYVQEKDLTAELSLNLFIDPTTVTQKGNQNV EVKLGETTVSKIIFNIQYLGGVRDNGVGTANGRIDTLNKVDGKFSHFAYMKPNQSLSSVT VTGQVTKGNKPGVNNPTVKVYKHIGSDDLAESVYAKLDDVSKFEDVTDMNSLDFDTNGGY SLNFFNNLDQSKNYVIKYEYGYDSNASNLEFQTHLFGYYNNYYTSNLTWKNGVAFYSNNAQ GDGKDKLKEPIIEHSTPIELEFKSEPPVEKHELTGTIEESNDSKPIDFEYHTAVEGAEGH

AEGTIEEEDSIHVDFEESTHENSXHHADVVEYEEDTNPGGGQVTTESNLVEFDEDSTKG
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LOCUS 5 (L4)
>G0788_STAAU8325, UNDEFINED PRODUCT 779770:781077 FORWARD
MW:50070
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SKLPKDLRDKNNRFVEKVSIEKAIVRHDERVKSANDAIKSLNEKDSIENRRLAQREVNKA
PMDVKEHLQKQLDALVAQKDAEKKVAPKVEAPQIQSPQIEKPKVESPKVEVPQIQSPKVE
VPQSKLLGGYQSLKDSFNKYGYKYLTDYKSYKEKYDTAKYYYNTYYKYKGAIDQTVLTVL
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ASSIKNTLSNLLSFWK
>G0790_STAAU8325, UNDEFINED PRODUCT 781580:782542 FORWARD
MW:36381
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ITSKRLAITQNIQDFVKDKKYNKDALVVKMQGFISSRTTYSDLKKYPYIKRMIWPFQYN
ISLKTKDSNVDLINYLKPKNIDSADVSQKLGYNIGGNFQSAPSIGGSGSFNYSKTIISYNQ
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LIQSGFNPSFITTLSSHERGKGDSEFEITYGRNMDATYAYVTRHRLAVDRKHDAFKNRNV
TVKYEVNWKTHEVVKIKSITPK
>G0791_STAAU8325, UNDEFINED PRODUCT 783104:784057 FORWARD
MW:35954
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KYVSLINYLKPKNKESTNVSQTLGYNIGGNFQSAPSLGGNGSFNYSKSIISYT
LOCUS 6 (D1)
>G0659_STAAU8325, UNDEFINED PRODUCT 644649:646835 REVERSE
MW:79536
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RDIVSIGARPINLLNSLRFGELDNKQNRLLKGVVKGIGGYGNCIGIPTTAGIEIEFDERY
DGNPLVNAMCVGVINHDMIQKGTAKGVGNSVIYVGLKTGRDGIHGATFASEELTESESK
RPSVQIGDPFVGKKLMEATLEAITFDELVGIQDMGAAGLTSSSEMAAKGGSGHLRLLEQ
VPTRPGISPYEMMLSETQERMILLVVEKGTEQKFLDLFDKHELDSAVIGEVTDTNRFVLT
YDDEVYADIPVEPLADEAPVYILEGEEKDYNTSKNDYTHIDVKDTFFKLLKHPTIASKHY
LY

LOCUS 7 (D1)
>G2308_STAAU8325, UNDEFINED PRODUCT 2206377:2207831 REVERSE MW:54671 MTDIINKLQAFADANQOSIAVRHTTDELTYQQLMDESSKLAHRLQGSKKPMILFGHMSPY MIVGMIGAIAKAGCGYVPVDTSIPEDRIKMIINKVQPEFVFNTTDESFESEGEVFTIEDI KTSQDPVIFDSQIKDNDTVYTIFTSGSTGEPKGVQIEYASLVQFTEWMLELNKSGNEQQW LNQAPFSFDLSVMAIYPCLASGGTLNLVDKNMINKPKLLNEMLTATPINIWVSTPSFMEM CLLLPTLNEEQYGSLSNEFFFCGEILPHRAAKALVNRFP SATIYNTYGPTEATVAVTSIQI TQEILDQYPTLPVGVERPGARLSTTDEGELVIEGQSVSLGYLKNDQKTAEVFNFDGDIRT YHTGDKAKFENGQWFIQGRIDFQIKLNGYRMELEEIETQLRQSEFVKEAIVVPVYKNDKV IHLIGAIVPTTEVTDNAEMTKNIKNDLKSRLPEYMI PRKFEWMEQLPLTSNGKIDRKKIA EVING
>G2309_STAAU8325, UNDEFINED PRODUCT 2207850:2208050 REVERSE MW:7893 MNGLYKGVFTKNFKRCNMKSKSQPPNKYVEAFKPYLLTLLYLAIFITLYLIYSGDTHN NFIYNEF
>G2310_STAAU8325, UNDEFINED PRODUCT 2208050:2208157 REVERSE MW:4396 MMTTNYYVESIKLKLNFIMNIDIMNCKKQILKRILY
LOCUS 8 (D4)
>G1191_STAAU8325, UNDEFINED PRODUCT 1158690:1159313 FORWARD MW:24008 DPNIHQAVVQDDNPDFESGEITQELQKGYKLKDRVLRPSMVKNQ
>G1192_STAAU8325, UNDEFINED PRODUCT 1159361:1161214 FORWARD MW:67451 MIKWRNFIMSKIIGIDLGTNSCVTVLEGDEPKVIONPEGSRTTPSVVAFKNGETQVGEV AKRQAITNPNTVQS IKRHMGT DYKVDIEGKSYTPQEISAMILQNLKNTAESYLGEKVDKA VITVPAYFNDAERQATKDAGKIAGLEVERIINEPTAAALAYGLDKTDKDEKVLVFDLGGG TFDVSILELGDGVFEVLSTAGDNKLGGDDFDQVIIDYLVAEFFKENGVDLSQDKMALQRL KDAAEKAKKDLSGVSQTQISLPFISAGENGPLHLEVNLTRSKFEELSDSLIRRTMEPTRQ AMKDAGLTNSDIDEVILVGGs
LOCUS 9A (D22) AA SEQUENCE
>G0560_STAAU8325, UNDEFINED PRODUCT 529664:558268 FORWARD MW:1029886 DQNTIKQGVN FTDADEAKRNAYTNAVTAQAEQILNKAQGPNTSKDGVETALENVQRAKNELNQNVANAK TTAKNALNNLTSINNAQKEALKSQIEGATTVAGVNVSTTASELNTAMSNLQNGINDEAA TKAALNGTQNLKAKQHANTAIDGLSHLTNAQKEALKQLVQQSTTVAAEAQGNEQKANNVD AAMDKLRQSIADNATTKQNQNYTDASQNKDAYMNAVTTAQGIIDQTTSP TLDPTVINQA AGQVSTTKNALNGNENLEAAKQASQSLGSLDNLNNAQKQTVTDQINGAHTVDEANQIKQ NAQNLNTAMGNLQKAIADKDATKATVNFTDADQAKQQA YNTAVTNAENIISKANGGNATQ AEVEQAIKQVNAAKQALNGNANVQHAKDEATALINSSNDLNQAQKDALKQOVQVQNTAVG VNVVKQTAQELNNA MTQLKQGIADKEQTKADGNFVNADPKQONAYNQAVAKAEALISATP DVVVTPSEITAA LNKVTPQAKNDLNGNTNLATAKQNVQHAIDQLPNLNQAQRDEYSKQITQ ATLVPNVNAIQQAATTLNDAMTQLKQGIANKAQIKGSENYHDADTDKQTAYDNAVTKAEE LLKQTTNPTMDPNTIQQALTKVNDTNQALNGNQKLADAKQDAKTTLGTL DHLNDAOKOAL

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LOCUS 9B (I2) AA SEQUENCE
>G0558_STAAU8325, UNDEFINED PRODUCT 527809:529263 FORWARD
MW:51904
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NDTQL
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MW:1029886
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LOCUS 9C (J13) AA SEQUENCE
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FTDADE
LOCUS 9D (M11) AA SEQUENCE
>G0560_STAAU8325, UNDEFINED PRODUCT 529664:558268 FORWARD
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TSLNDPQKTALKDQVTAATLVTAHVQIEQNANTLNQAMHGLRQSIQDNAAATKANSKYINE
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SIQDQQQTEAGSKF INEDKPQKDAYQAAVQNAKDLINQTNPTLDKAQVEQLTQAVNQAK
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MQALRNSIQDQQQTESGSKF INEDKPQKDAYQAAVQNAKDLINQTNPTLDKSQVEQLTQ
AVTTAKDNLHGDQKLARDQQQAVTTVNALPNLNHAQQQALTDAINAAPTRTEVAQHVTQA
TELDHAMETLKNKVDQVNTDKAQPNYTEASTDKKEAVDQALQAAESI TDPTNGSNANKDA
VDQVLTKLQEKENELNGNERVAEAKTQAKQIDQLTHLNADQIATAKQNI
LOCUS 9E (M13) AA SEQUENCE
>G0560 STAAU8325, UNDEFINED PRODUCT 529664:558268 FORWARD
MW:1029886
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KAPLENAKNQLQHSIDTQTSTTGMTQDSINAYNAKLTAARNKIQQINQVLAGSPTVEQIN
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LOCUS 10 (D9)
>G2169 STAAU8325, UNDEFINED PRODUCT 2045731:2047263 FORWARD
MW:55179
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>G2167 STAAU8325, UNDEFINED PRODUCT 2044443:2045375 REVERSE
MW:33794
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DIAVAKGADRPLIKPAAFASEIHGESGLDGPKLPSTPSRQAVAMPASDVIINKVMTSDTP
VTIVATGPLTNVATALIREPRIAHEIESITLMGGGTFGNWTPTAEFNIWVDAEAAKRVFE
SGITINVFLDVTHQVLAD
LOCUS 11 (D10)
>G2285 STAAU8325, UNDEFINED PRODUCT 2183380:2183499 REVERSE

MW:4917
MHQLKALLVLTHPRYYKTSQKHLYLIYLNKNSQSYLILFL
>G2286 STAAU8325, UNDEFINED PRODUCT 2183646:2184428 REVERSE MW:27575
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>G2287 STAAU8325, UNDEFINED PRODUCT 2184634:2185257 REVERSE MW:22980
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LOCUS 12 ()
>G1787 STAAU8325, UNDEFINED PRODUCT 1678934:1683439 REVERSE MW:166665
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>G1977 STAAU8325, UNDEFINED PRODUCT 1846179:1847864 REVERSE

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LOCUS 14 (D21)
>G2377_STAAU8325, UNDEFINED PRODUCT 2262585:2263772 REVERSE
MW:42602
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>G2375_STAAU8325, UNDEFINED PRODUCT 2261702:2262559 REVERSE
MW:30982
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>G2374_STAAU8325, UNDEFINED PRODUCT 2260182:2261696 REVERSE
MW:56424
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LOCUS 15 (I1)
>G2097_STAAU8325, UNDEFINED PRODUCT 1973418:1974263 REVERSE
MW:31442
VDLNDRLTFHKKRDKRIVVEIEHNYVP
SNHKNLAYRAAQLFIEQYQLKQGVTSIDKEIPVSAGLAGGSADAAATLRGLNRLFDIGA
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>G2096_STAAU8325, UNDEFINED PRODUCT 1972580:1973401 REVERSE
MW:30395
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TTAGASGGVTYKPMMSKEEATEVVNEVITLLEEKERLLPGGYLFLSDLVGNPSLLNKVGK
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LOCUS 17 (I3)
>G1894_STAAU8325, UNDEFINED PRODUCT 1776805:1778031 REVERSE MW:45559 DRTALEEQEATFGRKRHSGAPLTGGKEF DEIDLKAKDSHGEYIIDKDAHTRLAKEANTSILRRAFNYVDGTDRTGNFETGLLFIAFQ KATKQFIDIQNNLGSNDKLN EYITHRG SASFLVLPGVSKGGYLGETLFD
>G1893_STAAU8325, UNDEFINED PRODUCT 1775112:1776845 REVERSE MW:64202 MLVREDTLVKHYLTKFVAMLITAAMVCSFGLLKSQAEEQSSISDVYSVITDAKSALSNN ISNDNKQKAIEQVVS AVKKLSLEDNSESNAVKSDVRKLEDAKANDNQKDTLSQLTKSLIA YEEKLASKDAGSKI KLLQQQVDAKDAAMTKAIKDKNKAELSLNNSLNQIWTSTNETVIRN YDANQYGQIEVALLQLRIAIHKSPLDTAKVSHAWTTFKSNIDHVDKKSNTSANDQYHVSQ LNDALEKAIKAIDDNQLSDADAALTHFIETWPYVEGQIQTKDGALYTKIEDKIPYYQSVL DEHNKAHVKDGLVDLNNQIKEVVGHSSYFVDVMIIFLREGLEVLLIVMTLTMTNRNVKDK KGTASVIGGAIAGLVLSIILAITFVETLGN SGILRESMEAGLGIVAVILMFIVGVMMHKR SNAKRWNMIKNMYANAISNGNLVLLATIGLISVLREGVEV IIFYMGMI GELATKDFIIG IALAIVILIIIFALLFRFIVKLIPIFYIFRVLSI
LOCUS 18 (I5)
>G2386_STAAU8325, UNDEFINED PRODUCT 2274220:2275152 REVERSE MW:33616 MTEIDFDIAIIGAGPAGMTAAVYASRANLKTVMIERGIPGGQMANTEEEVENFPGFEMITG PDLSTKMFHAKKFGAVYQYGD IKSVEDKGEYKVINFGNKELTAKAVIIATGA EYKKIGV PGEQELGGRGVSYCAVCDGAFFKNKRLFVIGGGDSAVEEGTFLTKFADKVTIVHRRDEL AQRILQDRAFKNDKIDFIWSHTLKSINEKDGVGSVTLTSTKDGSEETHEADGVFIYIGM KPLTAPFKDLGITNDVGYIVTKDDMTTSVPGIFAAGDV RDKGLRQIVTATGDGSIAAQA AEYIEHLND
>G2387_STAAU8325, UNDEFINED PRODUCT 2275222:2276658 REVERSE MW:57062 HYRLYGIFLLDQLNGKEIVM TESIWQVLENLN NYEKLYLTYL VQGLTLNKLDFIHRGLLTLYHNELFVSENDVMVAWINQ GELIIAEKVDLTDVEPYIGAFIYLYFKNQPRNVTKKQITTWLGITQYKLNKMIEFLLSI
LOCUS 19 (I8)
>G2296_STAAU8325, UNDEFINED PRODUCT 2195143:2196150 REVERSE MW:37749 DDEIILLNPMGMAIEDISSAYFIYQQAQQQNIGTTLNLY
>G2295_STAAU8325, UNDEFINED PRODUCT 2193368:2195119 REVERSE MW:66415 MQNHTAVNTAQAILRLVDALLFEDIAGIVSNSEITKENGQTLLIYERETQQIKIPVYF SALNMFYRESSQPITIEGRVSKQPLTAAEFWQTIANMNCDSLHEWEVARVEEGLTTAATQ LAKQLSELDSLASHPFVMSEQFASLKDRPFHPLAKEKRG LREADYQVYQAE LNQSFP L MVA AVKKTHMIHGDTANIDELENLTVPIKEQATDMLNDQGLSIDDYVLFVHPWQYQHILPNV FAKEISEKLVVLLPLKFGDYLSSSSMRSLIDIGAPYNHV KVPFAMQSLGALRLTPTRYMK NGEQAEQLLRQLIEKDEALAKYVMVCD ETAWWSYMGQDNDFKDQLGHLTVQLRKYPEVL AKNDTQQQLVSMAALAANDRTLYQMICGKDNISKNDVMTLFEDIAQVFLKVTLSFMQY GAL

PELHGQNILLSFEDGRVQKCVLRDHD TVRIYKPWLTAHQSLPKYVVREDTPNTLINEDL ETFFAYFQTLAVSVNLYAIIIDAIQDLFGVSEHELMSELLKQILKNEVATISWVTTDQLAVR HILFDKQTPWPFKQILLPLLYQRDSGGGSMPSGLTTVPNPMV TYD
>G2294_STAAU8325, UNDEFINED PRODUCT 2192119:2193372 REVERSE MW:44835 MINQSIWRSNFRILWLSQFIAIAGLTVLVPLLP IYMASLQNL SVVEIQLWSGIAIAAPAV TTMIASPIWGLGDKISRKWMVLRALLGLAVCLFLMALCTTPLQFVLVRLLOGLFGGVVD ASSAFASAEAPAE DRGKVLGRLOQSSVSAGSLVGPLIGGV TASILGFSALLMSIAVITFIV CIFGALKLIETTHMPKSQTPNINKGIRRSFQCCLCTOQTCRFIIVGVLANFAMYGMTAL SPCLASSVNHTAIDDRSVIGFLQSAFWTASILSAPLWGRFNDKSYVKS VYIFATIACGCSA ILQGLATNIEFLMAARILQGLTYSALIQSVMFVVVNACHQQLKGT FVGTNSMLVVGQII GSLSGAAITSYTPATTFIVMGVFAVSSFLICSTITNQIND LOCUS 20 (J7/M10)
>G2187_STAAU8325, UNDEFINED PRODUCT 2068723:2070984 REVERSE MW:85428 LPDNFKTYCAKMSIKTSSIQYENDDIMRESYGDDYGIACCV SAMTIGKQM QFFGARANLAKTLLYAINGGKDEKSGAQVGP NFEGINSEVLEYDEVFKKFD QMMDWLAGVYINSLNVIHYMHDKYSYERIE MALHDEIVRTMATGIAGLSVAADSLSAIK YAQVKPIRNEEGLVVD FEIEGDFPKYGNND DRVDDIAVDLVERFMTKLRSHKTYRDEHT MSVLTITSNVVGKKTGNTPDGRKAGEPFAPGANPMHGRDQKGALSSLSVAKIPYDCCK DGISNTFSIVPKSLGKEPEDQNRNLTSM LDGYAMQCGHHLNINVFNRETLIDAMEHP E EY PQLTIRVSGYAVNFIKLTREQQLDVISRTFHESM
>G2186_STAAU8325, UNDEFINED PRODUCT 2067945:2068697 REVERSE MW:28498 MLKGHLHSVESLGTVDGPGRLRYILFTQGCLLRCLYCHNPDTWKISEPSREVTVD E MVNEI LPYKPYFDASGGGVTVSGGEPLLQMPFLEKLF AELKENG VHTCLDTSAGCANDTKAFQRH FEELQKHTDLILLDIKHIDNDKHIRLTGKPNTHILNFARKLSDMKQPWWIRHVLVPGYS D DKDDLKLGFEFINSLDNVEKFEILPYHQLGVHKWKT LGIAYELEDVEAPDDEAVKAAYRY VNFKGKIPVEL
>G2185_STAAU8325, UNDEFINED PRODUCT 2065846:2067657 REVERSE MW:69718 MKNIKMKLNIKAMRSVIMKRISKDIWAVFKLLYQNKGRFSINALLQLIMIFISSTYLIL LFNMMLKVAGQSQLTINN WTEIVSHPASVILLIIFILSVAF LIYVEFSLLVYMYAGFDR QIITFKSIFKNAFVNRKLIGVPVIFFFVIYLM LMIPIANLGLSSVLTKNIYIPKFLTEEL MKTTKGII IYGTFMIAVFILNFKLIFTLPLTILNRQSLFKNMRLSWQITKRNFRLVIEI VILELIIGAILTLIISGATYLAICVDEEGDKFLVSSILFVVLKSALFFYYLFTKLSLISV LVHLKQENVLDQPGLEFKYPKPKRKS RFFIISMVLAVTCFIGYNMYLLYNNTINTNIS I IGHRGFEDKGVENSIPSLKAAAKANVEYVELDTIMTKDKQFVVS HDNNLKRLTGVNKNIS ESNFKDIVGLKMRQNGHEAKFVSLDEFIETAKQSNVKLLVELKPHGKEPADYTQ RVIDIL KKHGVEHQYRVMSLDYDVMTKLKKEAPYLKCGYI IPLQFGHFKETSLDFFVIEDFSYS PR LVNQAHLNKEVYTWTINGEEDLTKYLQTNVDGIITDDPALADQIKEEKKDETYFDRSIR ILFE
>G2184_STAAU8325, UNDEFINED PRODUCT 2065335:2065676 FORWARD MW:12828 MTTQM KIKTYLVAGIKAALLDTTG IKLASKSETTSHTYQHQA LVDQLHELIANTDLNKL S YLNLD AFQKR DILAAHYIAKSAIRTKNLDQMTKAKQRLES IYNSISNPLHSQNN
>G2183_STAAU8325, UNDEFINED PRODUCT 2063238:2065145 REVERSE MW:71718

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MW:3842
MCVTRLVSSSSARLSKAI IIAVIVVYHLDVRGLF
>G2181_STAAU8325, UNDEFINED PRODUCT 2061438:2062628 FORWARD
MW:42182
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>G2180_STAAU8325, UNDEFINED PRODUCT 2059156:2061414 FORWARD
MW:84609
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>G2179_STAAU8325, UNDEFINED PRODUCT 2057714:2058967 FORWARD
MW:46482
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LOCUS 21 (G3)
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G1929
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LOCUS 22 (I19)
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>G0976 FRG_STAAU8325, UNDEFINED PRODUCT 977071:978240 REVERSE MW:43249
DFYDSETFKANLDRNDVRVIDDSIAQAMRDKIDEAKNEGDSIGGVVQVVVENMPVGVGSYVH
YDRK
LDGKIAQGVVSINAFKGVSFGEFGKAAEKPGEIQDEILYNSEIGYYRGSNHLGGLEGMSN
GMPIIVNGVMKPIPTLYKPLNSVDINTKEDFKATIERSDSCAVPAASIVCEHVVAFEIAKAL
LEEFQSNHIEQLKQIIERRQLNIEF
LOCUS 24:
G0243FRG
DRPIQVGSHFHFYEANAALDFEREMAYGKHLDI PAGAAVRFEFGDKKEVQLVEYAGKRKIFG
FRGMVNGPIDESRVYRPTDENDEYAGVFGDNGAENVNKKGGKRS

>G0244 STAAU8325, UNDEFINED PRODUCT 218549:220261 FORWARD MW:61780
MSFKMTQNQYTSLYGPTVGDSIRLGDTNLFAQIEKDYAVYGEEATFGGGKSIRDGMAQNP
RVTRDDVNVADLVISNAVIIDYDKVVKADIGIKNGYIFAIGNAGNPDIMDNVDIIIGSTT
DIIAAEGKIVTAGGIDTHVHFINPEQAEVALESGITTHIGGGTGASEGSKATTVTTPGPWH
IHRMLEAAEGLPINVGFTGKGQATNPTALIEQINAGAIGLKVHEDWGATPSALSHALDVA
DEFDVQIALHADTLNEAGFMEDTMAAVKDRVLHMYHTEGAGGGHAPDLIKSAAFSNLLPS
STNPTLPYTHNTVDEHLDVMITHHLNAAIPEDIAFADSRIRKETIAAEDVLQDMGVFSM
ISSDSQAMGRVGEVITRTWQVAHRMKEQRGPLDGD FEHNDNNRIKRYIAKYTINPAITHG
ISEYVGSIEPG
>LOCUS 25:
G0027 STAAU8325, UNDEFINED PRODUCT 32103:32513 REVERSE MW:16524
MNEYRNKKGPDYSIFKNNWKVLLMDTSKTIFSKYRWNKSFKAYKRSSDIVEFMLS KDDIL
RHSYELVQGLRKDLRLCNWPKFINRLNSVSKSVSKGVWVKVYRKHQ RMLRNTIYYPA
FNNGAIEGINNKIKLIK
LOCUS 26:
>G2458FRG STAAU8325, UNDEFINED PRODUCT 2348221:2350185 REVERSE MW:69055
VKIMRVTELLTKDTIAMDLMANDKNGVIDELVNQLDKAGKLSDVASFKEAIHNRESQSTT
GIGEGIAIPHAQVA AVKSPAIAFGKSKAGVDYQSLDMQPAHLFFMIAAPEGGAQTHLDAL
AKLSGILMDENVREKLLHASSPEEV LAI
>G2459 STAAU8325, UNDEFINED PRODUCT 2350185:2351102 REVERSE MW:32573
MIYTVTFNPSIDYVIFTNDFKIDGLNRATATYKFAGGKGINVSRVLKTL DVESTALGFAG
GFPGKFIIIDTLNNSAIQSNFIEVDEDTRINVKLKTGQETEINAPGPHITSTQFEQLLQOI
KNTTSEDIVIVAGSVPSIPSDAYAQIAQITAQTGAKLVVDAEKELAESVLPYHPLFIKP
NKDELEV MFNTTVNSD TDVIKYGRLLVDKGAQSVIVSLGGDGAIIYIDKEISIKAVNPQ GK
VVNTVGS GDSTVAGMVAGIASGLTIEKAFOQAVACGTATAFDEDLATRDAIEKIKSQVTI
SVLDGE
G2460FRG
DRTGCSASTIRRDLSKLQQLGKLQRVHGGAM
LKENRMVEANLTEKLATNLDEKKMIAKIAANQINDNECLFIDAGSSTLELIKYIQAKDII
VVTNGLTHVEALLKKGIKTIMLGQVKENTLATIGSSAMEILRRYCFDKAFIGMNGLDIE
LGLTTPDEQEALVKQTAMSLANQSFVLIDHSKFNKVYFARVPLESTTIITSEKALNQES
LKEYQQKYHFIGGTL
LOCUS 27:
G1326FRG
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>G1327 STAAU8325, UNDEFINED PRODUCT 1284689:1285450 FORWARD

MW: 27870
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NIFPYTGVVAFKSATGFVVGKNTILTNNKHVSKNYKVGDRITAHPNSDKGNNGGIYSIKKII
NYPGKEDVSVIQVEERAIERGPKGFNFNDNVT PFKYAAGAKAGERIKVIGYPHPYKNKYV
LYESTGPVMSVEGSSIVYSAHTESGNSGSPVLNSNNELVGIHFASDVKNDDNRNAYGVYF
TPEIKKFIAENIDK
>G1329_STAAU8325, UNDEFINED PRODUCT 1285505:1286227 FORWARD
MW: 26340
LKMKNIVIKSMAALAILTSVTGINAAVVEETOQIANAEKNVTQVKDTNIFPYNGVVSFK
DATGFVIGKNTIITNNKHVSKDYKVGDRITAHPNGDKGNNGGIYKIKSISDYPGDEDISVMN
IEEQAVERGPKGFNFNENVQAFNFAKDAKVDKIKVIGYPLPAQNSFKQFESTGTIKRIK
DNILNFDAYIEPGNSGSPVLNSNNEVIGVYGGIGKIGSEYNGAVYFTPQIKDFIQKHIE
Q
>G1330_STAAU8325, UNDEFINED PRODUCT 1286327:1287067 FORWARD
MW: 26652
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GVTWMGAGTGFVVGNTIITNNKHVTYHMKVGDEIKAHPNGFYNNGGGLYKVTKIVDYPGK
EDIAVVQVEEKSTQPKGRKFKDFTSKFNIASEAKENEPISVIGYPNPNGNKLQMYESTGK
VLSVNGNIVTSDAVVQPGSSGSPILNSKREAIGVMYASDKPTGESTRSFAVYFSPEIKKF
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>G1332_STAAU8325, UNDEFINED PRODUCT 1287228:1287941 FORWARD
MW: 25679
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DKAVHPKNRNFKDYTGILKIASEAKENERISIVGYPEPYINKFQMYESTGKVL SVKGNMI
ITDAFVEPGNSGSAVFNSKYEVVGVHFGGNGPGNKSTKGYGVYFSPEIKKF IADNTDK
>G1333_STAAU8325, UNDEFINED PRODUCT 1288095:1288811 FORWARD
MW: 25655
MNKNIIIKSIAALTILTSITGVGTTMVEGIQQTAKAENTVKQITNTNVAPYSGVTWMGAG
TGFVVGNTIITNNKHVTYHMKVGDEIKAHPNGFYNNGGGLYKVTKIVDYPGKEDIAVVQV
EEKSTQPKGRKFKDFTSKFNIASEAKENEPISVIGYPNPNGNKLQMYESTGKVL SVNGNI
VSSDAIIQPGSSGSPILNSKHEAIGVIYAGNKPSGESTRGFAVYFSPEIKKF IADNLDK
>G1334FRAG._STAAU8325, UNDEFINED PRODUCT 1288994:1290730
FORWARD MW: 66904
MILKAFESYNISIKFFNNNCATKTQNFHHQHPNYQHRNITKCYNKSITQRDKLLMQRRRN
HMSITEKORQQQAELHKKLWSIANDLRGNMDASEFRNYILGLIFYRFLSEKAEQEYADAL
SGEDITYQEAWADEEYREDLKAEID
ORF1 (AF7)
SGTGFIVGKNTIVTNKHVVAGMEIGAHIIAHPNGEYNNGGFYKVKKIVRYSGQEDIAILH
VEDKAVHPKNRNFKDYTGILKIASEAKENERISIVGYPEPYINKFQMYESTGKVL SVKGN
MIITDAFVEPGNSGSAVFNSKYEVVGVHFGGNGPGNKSTKGYGVYFSPEIKKF IADNTDK
ORF2 (AF7)
MNKNIIIKSIAALTILTSITGVGTTMVEGIQQTAKAENTVKQITNTNVAPYS
GVTWMGAGTGFVVGNTIITNNKHVTYHMKVGDEIKAHPNGFYNNGGGLYKVTKIVDYPGK
EDIAVVQVEEKSTQPKGRKFKDFTSKFNIASEAKENEPISVIGYPNPNGNKLQMYESTGK
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LOCUS 28 (H130)
>G1388_STAAU8325, UNDEFINED PRODUCT 1337496:1338446 REVERSE MW:36053
MGNHFQYAFENKRYHTWNYHLKNKFGQKIFKVALDGGFDCPNRDGTVAHGGCTFCSAAGS
GDFAGNRADSIQVQFKEIKEKMHEKWHEGKYIAYFQAFTNTHAPVEVLKEKFEPVLKEPG
VVGLSIGTRPDCLPDDVVEYLADLNQRTYLWVELGLQTIHQSTSDLINRAHDMKTYDGV
AKLRKHNNVCTHIINGLPGEDYDMMATAKEVAQMDVQGIKIHLHLKGTMPVKQYDK
GLLTFMTQEEYTNLVVDQLEVIPEMIVHRITGDGPIDIMVGPMWSVNKWEVLNGIDAE
ARRNSYQGLRYKSKVKQ
>G1389_STAAU8325, UNDEFINED PRODUCT 1338556:1339734 FORWARD MW:43345
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AVWPNGGRQTFNAIYLAQNIGVAVGAAMGGFVAEFSFNYIFLANLIMYVVFALVAVTQFN
IEINAKVKYPTHLDITGKKNKARFISLVLCAMFAICWVAYIQWESTIASFTQSNISMA
QYSVLWTINGIMILVAQPLIKPILYLLKGNLKKQMFVGIIIFMLSFFVTSFAENFTIFVV
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RMMFIGMMLLLVFALILLMVFKENNTQPKKIDA
>G1390_STAAU8325, UNDEFINED PRODUCT 1340025:1342439 FORWARD MW:91754
VLNYNHNQIEKKWQDYWDENKTFKTNDNLGQKKFYALDMFPYPSGAGLHVGHPEGYTATD
IISRYKRMQGYNVLHPMGWDAFGLPAEQYALDTGNDPREFTKKNIQTFKRQIKELGFSYD
WDREVNTTDPEYYKWTQWIFIQLYNKGLAYVDEVAVNWCPALGTVLSNEEVIDGVSERGG
HPVYRKPMKQWVLKITEYADQLLADLDDLDWPESLKDQMORNWIGRSEGAQVSFDVDNTEG
KVEVFTTRPDTIYGASFLVLSPEHALVNSITTDEYKEKVKAYQTEASKKSDLERTDLAKD
KSGVFTGAYATNPLSGEKVQIWIADYVLSTYGTGAIMAVPAHDDRDEYFAKKFDLPITIEV
IEGGNVEEAAYTGEKGHINSGLDGLNEAAITKAIQILLEQKGAGEKKVNYKL RDWLFSR
QRYWGEPIPVIIHWEDGMTTVP EEELPLLLPETDEIKPSGTGESPLANIDSFVNVVDEKT
GMKGRRENTMPQWAGSCWYYLRYIDPKNENMLADPEKLKHWLPVDLYIGGVEHAVLHLL
YARFVHKVLYDLAIVPTKEPFQKLFNQGMILGEGNEKMSKSGNVINPDDIVQSHGADTL
RLYEMFMGPLDAAIAWSEKGLDGSRRFLDRVRLMVNEDGTLSSKIVTTNNKSLDKVYNQ
TVKKVTEDEFETLGFNNTAISQLMVFINECYKVDEVYKPYIEGFVKMLAPIAPHIGEELWSK
LGHEESITYQPWPPTYDEALLVDDEVEIVVQVNGKLRAKIKIAKDTSK EEMQEIALSNDNV
KASIEGKDIMKVIAPVQKLVNIVAK
LOCUS 29A (N10/GE2)
>G2804_STAAU8325, UNDEFINED PRODUCT 2682166:2682924 REVERSE MW:29096
MAYISLNYHSPTIGMHQNLTVILPEDQSFFNSDTTVKPLKTLMLLHGLSSDETMYRYS
IERYANEHKLAVIMPNVDHSAYANMAYGHSYYDYILEVYDYVHQIFPLSKKRDDNFIAGH
SMGGYGTIKFALTQGDKFAKAVPLSAVFEAQNLMLEWDFSKEAIIGNLSSVKGTEHDP
YLLDKAVAEDKQIPKLLIMCGKQDFLYQDNLDFIDYLSRINVPYQFEDGPGDHDYAYWD
QAIKRAITWMVND

>G2805_STAAU8325, UNDEFINED PRODUCT 2683043:2685673 REVERSE MW:93576
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ADSEKNNMIETPQLNLTANDTSDISANTNSANVDSTTKPMSTQTSNTTTTEPASTNETPQ
PTAIKNQATAAKMQDQTVPQEANSQVDNKTNDANSIATNSELKNSQTLDLPOSSPQTIS
NAQGTSTKPSVRTRAVRSLAVAEPVVNAADAKGTNVNDKVTASNFKLEKTTFDPNQSGNTF
MAANFTVTDKVKSGDYFTAKLPDSLTLGNGDVDSNSNNTMPIADIKSTNGDVVAKATYDI
LTkTYTTFVFTDYVNNKENINGQFSLPLFTDRAKAPKSGTYDANINIADEMFNKITYNYS
SPIAGIDKPNGANISSQIIGVDTASGQNTYKQTVFVNPQORVLGNTWVYIKGYQDKIEES
SGKVSATDTKLRIFEVNDTSKLSDSYADPNDSNLKEVTDQFKNRIYYEHPNVASIKFGD
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VNPKDPTPGPPVDPEPSPDPEPEPTPDPEPSPDPEPEPSPDPPDSDSDSDSDSDSDSGS
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TGDKSENTNATLFGAMMALLGSLLLFRKRKQDHKEKA
>G2806_STAAU8325, UNDEFINED PRODUCT 2686026:2686727 REVERSE MW:27428
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FLIEGNIIREHYNQNGDVYRYFNKEQVLFPISNLFHPKEVNELCTALTDCTVLGLPRELM
AFLCKANDDIFLTLFALINDNEQOHMNYNMAITSKFAKDRIIKLICHLCQTVGYDQDEFY
EIKQFLTIQLMSDMAGISRETAGHIIHELKDEKLVVKDHKNWLVSXHLFNDVCV
LOCUS 30 (N15)
>G2078_STAAU8325, UNDEFINED PRODUCT 1955555:1957645 REVERSE MW:77813
MQKAFRNVLVIVIIGVVIIFGLFSYLNNGNMPKQLTYNQFTEKLEKGLKTLLEIQPQONV
YMVSGKTKNDEYSSITILYNNEKELQKITDAKKQNGVKLTIKEEEKQSVFVSILSTLIP
VVVIALLFIFFLSQAQGGSGGRMMNFGKSKAKMYDNNKRRVRFSVDVAGADEEKQELIEI
VDFLKDNNKFKEMGSRIKGVLLVGPPTGKTLLARAVAGEAGAPFFSISGSDFFVEMFVG
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NEGIIMIAATNRPDILDPALLRPGRFDRQIQVGRPDVKGREAILHVHAKNKPLDETVDLK
AISQRTPGFSGADLENLLNEASLIIVREGKKKIDMRDIEEATDRVIAGPAKKSRSVISKE
RNIVAHHEAGHTIIGMVLDEAEVVHKVTIVPRGQAGGYAMMLPKQDRFLMTEQELLDKIC
GLLGGRVSEDINFNEVSTGASNDFERATQIARSMVTQYGMSKKLGPLQFGHSNGQVFLGK
DMQGEPNYSSQIAYEIDKEVQRIVKEQYERCKQILLEHKEQLILIAETLLTEETLVAEQI
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IAEDKKEADKSDEKDEPAHRQAPNIEKPYDPNHPDNK
>G2077_STAAU8325, UNDEFINED PRODUCT 1954445:1955323 REVERSE MW:31822
MTHDYIVKALAFDGEIRAYAALTETVQEAQTRHYTWPTASAAMGRMTATAMMGAMLKG
DQKLTVTVDGQGPIGRIADANAKGEVRAYVDHPQTHFLNEQGLDVRRAVGNGSIMV
VKDVGMKDYFSGASPIVSGELGEDFTYYATSEQTPSSVGLGLVNPNTIKAAGGFIIQ
VMPGAKDETISKLEKAISEMTPVSKLIEQGLTPEGLLNEILGEDHVQILEKMPVQFECNC
SHEKFLNAIKGLGAEIQNMIEDHGAEAVCHFCGNKYKYTEEELNVLLESIA

LOCUS 31
>G2117_STAAU8325, UNDEFINED PRODUCT 1991063:1995499 REVERSE MW:170933 DQLDVNRWRQNETYKTMVPLGVRGKDDILSLNLH EKAHGPHGLVAGTTGSGKSEIIQSYILSLAINFHPHEVAFLLIDYKGGGMANLFKDLVHL VGTITNLDGDEAMRALTSIKAELRKRQRLFGEHDVNHINQYHKLFKEGIATEPMPHLFII SDEFAELKSEQPDFMKELVSTARIGRSLGIHLILATQKPSGVVDDQIWSNSKFKLALKVQ DRQDSNEILKTPDAADITLPGRAYLQVGNNEIYELFQSAWSGATYDIEGDKLEVEDKTIY MINDYGQLQAINKDLGLEDEETKENQTELEAVIDHIESITTRLEIEEVKRPWLPLPEN VYQEDLVETDFRKLWSDDAKEVELTLGLKDVPEEQYQGPMVLQLKKAGHIALIGSPGYGR TTFLHNIIFDVARHHR
LOCUS 32 HE9
>G2647_STAAU8325, UNDEFINED PRODUCT 2528508:2529707 REVERSE MW:44138 VINMLYLEVLKRNFTYLLIGNFLRRSCFVLFSLQIIWFTVELTNQSSKLKLSMMVMSQTL PFIIFGIFGGAYS DKHNKKKILYLS
LOCUS 32 P9
>G2648_STAAU8325, UNDEFINED PRODUCT 2530085:2534971 REVERSE MW:178787 DPKLPTGEKEEVPGKPGIKNPETGDVVR PPVDSVTKYGPVKGDSIVEKEEIPFEKERKFNPDLAPGTEKVTREGQKGEKTIITPTLN PLTGEIISKGESKEEITKDPINELTEYGPETITPGHRDEFDPKLPTGEKEEVPGKPGIKN PETGDVVRPPVDSVTKYGPVKGDSIVEKEEIPFEKERKFNPDLAPGTEKVTREGQKGEK ITPTLNPLTGVIIISKGEPKEEITKDPINELTEYGPETITPGHRDEFDPKLPTGEKEEV PGKPGIKNPETGDVVRPPVDSVTKYGPVKGDSIVEKEEIPFKKERKFNPDLAPGTEKVT EGQKGEKTIITPTLNPLTGEIISKGESKEEITKDPINELTEYGPETITPGHRDEFDPKL PTGEKEEVPGKPGIKNPETGDVVRPPVDSVTKYGPVKGDSIVEKEEIPFEKERKFNPDLA PGTEKVTREGQKGEKTIITPTLNPLTGEIISKGESKEEITKDPINELTEYGPETITPGH RDEFDPKLPTGEKEEVPGKPGIKNPETGDVVRPPVDSVTKYGPVKGDSIVEKEEIPFKKE RKFNPDAPGTEKVTREGQKGEKTIITPTLNPLTGEIISKGESKEEITKDPINELTEYG PETITPGHRDEFDPKLPTGEKEEVPGKPGIKNPETGDVVRPPVDSVTKYGPVKGDSIVEK EEIPFEKERKFNPDLAPGTEKVTREGQKGEKTIITPTLNPLTGEIISKGESKEEITKDP INELTEYGPETITPGHRDEFDPKLPTGEKEEVPGKPGIKNPETGDVVRPPVDSVTKYGPV KGDSIVEKEEIPFEKERKFNPDLAPGTEKVTREGQKGEKTIITPTLNPLTGEIISKGES KEEITKDPVNELTEFGGEKIPQGHKIDFDPNLPTDQTEKVPKPGIKNPDTGKVIIEEPVD DVIKHGPKTGTPETKTVEIPFETKREFNPKLQPGEEVRVQEGQPGSKTIITPITVNPLTG EKVGEGQPTTEEITKQPVDKIVEFGGEKPKDPKGPENPEKPSRPTHPSGPVNPNNPGLSKD RAKPNGPVHSMKNDKVKKSKIAKESVANQEKKRAELPKTGLESTQKGLIFSSIIGIAGL MLLARRRKN
LOCUS 33
>G2811_STAAU8325, UNDEFINED PRODUCT 2691933:2692430 REVERSE MW:19378 MNLFFNTRNVTTKGVYNMKS SRLEIVSTIVKKHKIYKKEQIIISYIEEYFGVRYSATIA KDLKELNIYRVPIDCETWIYKAINNQTEQEMREKFRHYCEHEVLSSIINGSYIIVKTSPG FAQGINYFID

>G2812_STAAU8325, UNDEFINED PRODUCT 2692749:2694275 REVERSE MW:56329
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QGSPIVSLTHVNNYGGQDNRNNAAWIGDKMIYGDGDGRTFTSLSGANDVVAHELTHGVTQ
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HMKDYVFTEKDNGGVHTNSGIPNKAAYNVIQAIGKSKSEQIYYRALTEYLTSNSNFKDCK
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LOCUS 34
>G1540_STAAU8325, UNDEFINED PRODUCT 1494147:1495196 FORWARD MW:38745
MTKHYLNSKYQSEQRSSAMKKITMGTASIILGSLVYIGADSQQVNAATEATNATNNQSTQ
VSQATSQPINFQVQKDGSEKSHMDDYMQHPGKVIKQNNKYFQTVLNNASFWKEYKFYN
ANNQELATTVVNDNKKADTRTINVAVEPGYKSLTTKVHIVVPQINYNHRYTTHLEFEKAI
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>G1539_STAAU8325, UNDEFINED PRODUCT 1493258:1493938 REVERSE MW:24836
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KKNGKLYVQITVNHSHWITGMSIEGHKENIISKNTAKDERTSEFEVSKLNGKIDGKIDVY
IDEKVNGKPFKYDHHYNITYKFNGPTDVAGANAPGKDDKNSASGSDKSGDGTGQSESN
SSNKDKVENPQTNAGTPAYIYAIPVASLALLIAITLFRKKS KGNVE
LOCUS 35 P15
>G2062_STAAU8325, UNDEFINED PRODUCT 1927377:1928480 FORWARD MW:40937
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IEAYNSLS
>G2063_STAAU8325, UNDEFINED PRODUCT 1928805:1936238 REVERSE MW:263021
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PATTTKDNAKEAIATKANERKTAIAQTQDITAEIIAANADVDNAVQANSNIEAANSQN
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TENGKANQAI SAATTNAQVDEAKANAEAAINAVTPKVVKKQAAKDEIDQLQATQTNVINN
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KNDVDQAVTTQNAIDNTTGATTEEKNAAKDLVLKAKEKAYQDILNAQTTNDVTQIKDQA
VADIQGITADTTIKDVAKDELATKANEQKALIAQTADATTEEKEQANQQQVDAQLTQGNQN
IENAQSIDDVNTAKDNAIQAIQASTDVKTNARAEELLTEMQNKITEILNNNETTNEEK
GNDIGPVRAAYEEGLNNINAATTTGDVTTAKDTAVQKVQQLHANPVKKPAGKKELDQAAA
DKKTQIEQTPNASQQEINDAKQEVDTNELNQAKTNVDQSSTNEYVDNAVKEGKAKINAVKT
FSEYKDALAKIEDAYNAKVNEADNSNASTSSEIAEAKQKLAEKQTADQNVNQATSKDD
IEVQIHNDLDNINDYTIPTGKKESATTDLYAYADQKNNISADTNATQDEKQQAIIKQVDQ
NVQTALESINNGVDNGDVEDDALTGKAAIDAIQVDATVKPKANQAEVKAEDTKESIDQS
DQLTAEKTEALAMIKQITDQAKQGITDATTAEVEKAKAQGLEAFDNIQIDSTEQKAI
EELETALDQIEAGVNVNADATTEEKEAFTNALEDILSKATEDISDQTTNAEIIATVKNSAL

EQLKAQRINPEVKKNALAEIREVVNKQIEI IKNADADASAKEIARTDLGRYFDRFADKLD
KTQTNAEVAELQNV TI PAIEAIVPQNDPDANDTNNGIDNNDATANSNANATPENTGQPNV
SETTANGKADASPTTPNNSDAATGETTATSATDDANDKPQANNSSVDASTNSPTMDNDV
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ASSADSKDNASVNSDKQNAEVNNSAESQSTNDKVAQPKSENKAKAEKDGSDSTNQSMVES
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KPSTSASSEAKEKMTSTNVSQKDDTATADTNDTQKSVGSAANNKATQNDGANASPATVSN
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GMAFLIRRF TKK DQ QTEE
LOCUS 36
>G2732_STAAU8325, UNDEFINED PRODUCT 2619995:2620498 REVERSE
MW:19899
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MW:24203
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>G2734_STAAU8325, UNDEFINED PRODUCT 2622068:2623216 REVERSE
MW:40979
SASIGISATEAVLIIGTSKVNRLGVPLSVFFGGVKMMIPNMVKYPILMLPILTTA
IVSGLVSALVGIHGTKEAGFGFIGMVGPINAFKFMEVDSAWLSVLLIVVAFFVVPFVTA
WLADIIRKVFRLYTNDIFKFMG
LOCUS 37
>G2805_STAAU8325, UNDEFINED PRODUCT 2683043:2685673 REVERSE
MW:93576
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PTAIKNQATAAKMQDQTVPQEANSQVDNKTNDANSIATNSELKNSQTLDLPOSSPQTIS
NAQGTSKPSVRTRAVRSLAVAEPVVNAADAKGTNVNDKVTASNFKLEKTTTFDPNQSGNTF
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LTKTYTFVFTDYVNNKENINGQFSLPLFTDRAPKSGTYDANINIADMFNNKITYNYS
SPIAGIDKPNGANISSQIIGVDTASGQNTYKQTVFVNPKQRLGNTWVYIKGYQDKIEES
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>G2806_STAAU8325, UNDEFINED PRODUCT 2686026:2686727 REVERSE
MW:27428
DHKNWLVS KHLFNDVCV

LOCUS 38
>G0307_STAAU8325, UNDEFINED PRODUCT 273255:274481 REVERSE MW:45016
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VGAYVQMVPGELVLTAIPLNIVNAIIVSCLLNVPVSVEEKEDIYSLKNNEVERQPFSSFL
GDSVLAAGKLVLIIFVISFVALADLDFDRFINLITGLIAGWIGIKGSFGLNQILGVFMY
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LOCUS 39
>G0761_STAAU8325, UNDEFINED PRODUCT 754164:754763 REVERSE MW:23413
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>G0762_STAAU8325, UNDEFINED PRODUCT 754732:756288 REVERSE MW:59413
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>G0763_STAAU8325, UNDEFINED PRODUCT 756281:759967 REVERSE MW:139830
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LOCUS 40
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>G2787_STAAU8325, UNDEFINED PRODUCT 2666088:2667935 REVERSE MW:70480
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LOCUS 41
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>G2568_STAAU8325, UNDEFINED PRODUCT 2448892:2449062 REVERSE MW:6765
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>G2569_STAAU8325, UNDEFINED PRODUCT 2449038:2450111 REVERSE MW:40086
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VENGKVIITPELNGSILPGITRKSIIELAKNLGYEVEERRVSIIDELFESYDKGELTEVFGS
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>G2570_STAAU8325, UNDEFINED PRODUCT 2450449:2451411 REVERSE MW:36053
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LOCUS 42
G2383
>G2383_STAAU8325, UNDEFINED PRODUCT 2270269:2271210 REVERSE MW:35868
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G2384
>G2383_STAAU8325, UNDEFINED PRODUCT 2270269:2271210 REVERSE MW:35868
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G2385
>G2385_STAAU8325, UNDEFINED PRODUCT 2272315:2273223 REVERSE
MW:34812
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LOCUS 43
G1925
>G1925_STAAU8325, UNDEFINED PRODUCT 1807198:1808076 FORWARD
MW:33043
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MW:56155
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G1927
>G1927_STAAU8325, UNDEFINED PRODUCT 1809759:1810976 REVERSE
MW:44221
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GIAINKITRMGRLESYFAISTAMFGQPEVLTIKDIIPRLSRKLYTIATSGMSAVSMAM
LGSYMQMIEPKFVVAVMLNIFSAIIASVINPYKSDDTDVEIDNLTKSTETKTNGKTG
KPKKVAFFQMIGDSAMDGFKIAVVAVMLLAFISLMEAINIMFGSVGLNFKQLIGYVFAP
IAFLMGIPWSEAVPAGSLMATKLITNEFVAMLDKFNVLGDVSARTQGIISVYLVSFANFG
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LOCUS 44

>G2207_STAAU8325, UNDEFINED PRODUCT 2094883:2096472 FORWARD MW:59177
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ESIFKSPQHTYTKRLIDAIPIHQTRPPRPLNNDILLKFDRVSVDTSPSGSLYRAVNDI NLAIRKGETLGIVGESGSGKSTLAKTVVGLKEVSEGFIIWYNELPLSLFKDDELKSLRQEI QMIFQDPFASINPRFKVIDVIKRLIIHGKVKDNDI IKT VVSLLKVGGLDQTFLYRYPH ELSGGQRQRVSIARALAVEPKVIVCDEAVSALDVSIOKDI IELLKQLQLDFGITYLFITH DMGVINEIC
LOCUS 45
>G2152_STAAU8325, UNDEFINED PRODUCT 2029896:2030945 REVERSE MW:39494
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LOCUS 46 G5 (1)
>G2647_STAAU8325, UNDEFINED PRODUCT 2528508:2529707 REVERSE MW:44138
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>G2648_STAAU8325, UNDEFINED PRODUCT 2530085:2534971 REVERSE MW:178787
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LOCUS 47 HF6
>G2560_STAAU8325, UNDEFINED PRODUCT 2436743:2440789 REVERSE MW:146086
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GNKVEVSTAKSDEQASPKSTNEDLNTKQTIISNQEALQPDQENKSVVNVQPTNEENKKVD AKTESTTLNVKSDAIKSNDETLVDNNSNSNNENNADIILPKSTAPKRLNTRMRIA AVQPS STEAKNVNDLITSNTTLTVVDADKNNKIVPAQDYLSLKSQITVDDKVKSGDYFTIKYSDT VQVYGLNPEDIKNIGDIKDPNNGETIATAKHDTANNLITYTFTDYVDRFNSVQMGINYSI YMDADTIPVSKNDVEFNVTIGNTTTKTTANIQYPDYVVNEKNSIG
>G2561_STAAU8325, UNDEFINED PRODUCT 2441159:2444143 REVERSE MW:107795 ETSDS DS DS DS DS TGSENNNSNNGTLFGGLFAALGSLLLFGRKKQNK
LOCUS 49 B13
G1539
>G1539_STAAU8325, UNDEFINED PRODUCT 1493258:1493938 REVERSE MW:24836 LKNILKVFNTTILALIIIIATFSNSANAADSGTLNIEVYKYNTNDTSIANDYFNKPAKYI KKNGLYVQITVNHSHWITGMSIEGHKENIISKNTAKDERTSEFEVSKLNGKIDGKIDVY IDKVNKGKPFKYDHHYNITYKFNGPTDVAGANAPGKDDKNSASGSDKGSDDTTTGQSESN SSNKDKVENPQTNAGTPAYIIYAI PVASLALLIAITLFVRKKSKGNVE
G1540
>G1540_STAAU8325, UNDEFINED PRODUCT 1494147:1495196 FORWARD MW:38745 MTKHYLNSKYQSEQRSSAMKKITMGTASIIILGSLVYIGADSQQVNAATEATNATNNQSTQ VSQATSQPINFQVQKDGSSSEKSHMDDYMQHPGKVIKQNNKYYFQTVLNNASFWKEYKFYN ANNQELATTVVNDNKKADTRTINVAVEPGYKSLTTKVHIVVPQINYNHRYTTHLEFEKAI PTLADAAKPNNVVKPVQPKPAQPKTPTEQTKPVQPKVEKVKPTVTTTSKVEDNHSTKVVST DTTKDQ
LOCUS 49 K16
G1540
>G1540_STAAU8325, UNDEFINED PRODUCT 1494147:1495196 FORWARD MW:38745 DQTKTQTAHTVKTAAQTAQEONKVQTPVKDVATAKSESNNQAVSDNKSQQTNKVTKH NETPKQASKAKELPKTGLTSVDNFISTVAFATLALLGSLSLLLFKRKESK
G1542
>G1542_STAAU8325, UNDEFINED PRODUCT 1495403:1497337 FORWARD MW:72192 MNNKQOKEFKSFYSIRKSSSLGVAISVAILLLMSNGEAQAAAEETGGTNTAEQPKTEAVA SPTTTSEKAPETKPVANAVSVSNKEVEAPTSETKEAKEVKEVKAPKETKEVKPAKATNN TYPILNOELREAIKNPAIKDKDHSAPNSRPIDFEMKKKDGTOOFYHYASSVKPARVIFTD

SKPEIELGLQSGQFWRKFVYEGDKKLPIKLVSYDTVKDYAYIRFSVSNGTKAVKIVSST
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KLPEKLKAEYKKKLEDTKKALDEQVKSATTEFQNVQPTNEKMTDLQDTKYVVYESVENNE
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G1543
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MW:4973
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MW:3849
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G1456
>NONE, UNDEFINED PRODUCT 1497815:1498165 REVERSE MW:12767
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LOCUS 50 GB2
>G1392_STAAU8325, UNDEFINED PRODUCT 1343118:1349675 FORWARD
MW:238192
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LOCUS 50 G10

>G1392_STAAU8325, UNDEFINED PRODUCT 1343118:1349675 FORWARD MW:238192
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LOCUS 51 (GC8)
>G2831 FRG_STAAU8325, UNDEFINED PRODUCT 2720353:2721114 FORWARD MW:27865
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LOCUS 52 (E1)
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>G0407 FRG_STAAU8325, UNDEFINED PRODUCT 372110:372754 REVERSE MW:23024
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LOCUS 53 (E20)
>G2244 FRG_STAAU8325, UNDEFINED PRODUCT 2142042:2143301 REVERSE MW:46800
MKLTVVGLGYIGLPTSIMFAKHGVDVLGVDINQQTIDKLQSGQISIEEPGLQEVYEEVLS SGKLVSTTPDASDVFIIAVPTPNDDQYRSCDISLVMRALDSILSFLEKGNIIIVESTI APKTMDDFVKPVIENTLGFITIGEDIYLVHCPERVLPKGILEELVHNNRIIGGVTEACIEAG KRVRVTFVQGEMIETDARTAEMSKLMENTYRDVNIALANELTKICNNLNINVLVDVIEMAN KHPRVNIHQPGPGVGHCCLAVDYPYFIIAKDPENAKLIQTGREINNSMPAYVVDTTKQIIK VLSGNKVTVFGLTYKGDVDDIRESPAFDIYELLNQEPDIEV
>G2245_STAAU8325, UNDEFINED PRODUCT 2143358:2144242 REVERSE MW:33683
MRKNILITGVHGYIGNALKDKLIEQGHQVDQINVRNQLWKSTSFKDQDVLIHTAALVHNN SPQARLSDYMQVNMLLTQQLAQKAKAEDVKQFIFMSTMAVYGKEGHVGKSDQVDTQTPMN PTTNYGISKKFAEQALQELISDSFKVAIVRPPMIYGAHCPGNFORLMQLSKRLPIIPNIN NQRSALYIKHLTAFIDQLISLEVTGVYHPQDSFYFDTSVMYIEIRQSHRKTVLINMPSM LNKYFNKLSVFRKLFGNLIYSNTLYENNALEIIPGKMSLVIADIMDETTTKDKA
>G2246_STAAU8325, UNDEFINED PRODUCT 2144245:2144799 REVERSE MW:21063
MKRLFDVVSIIYGLVVLSPILLITALLIKMESPGPAIFKQKRPTINNELFNIYKFRSMKI DTPNVATDLMDSTSYITKTGKVIKRTSIDELPQLNLVLKGEMSIVGPRPALYNQYELIEK RTKANVHTIRPGVTGLAQVMGRDDITDDQKVAYDHYLTHQSMMLDMYIIYKTIKNIIVTS EGVHH
>G2247 FRG_STAAU8325, UNDEFINED PRODUCT 2144813:2146015 REVERSE MW:46577
INTMKYYNLLK
LOCUS 54 (E105)
>G2254 FRG_STAAU8325, UNDEFINED PRODUCT 2152390:2153505 REVERSE MW:42140
MKLKRLFKTSSMTLVKKKLLTMPMAKREIIMFDDKILLI
>G2255_STAAU8325, UNDEFINED PRODUCT 2153408:2155321 REVERSE MW:72361
LLMIKKFLNECHNKIINRKDGLGYKQQMRGFMALSVKLRLILALIDSLIVTFSVFSY YILEPYFKTYSVKLLILAAISLFISHHISAFIFNMHYHRAWAYASVSELILIVKAVTTSIV ITMVVVTIVTGNRPFFRLYLITWMMHLILIGGSRLFWRIYRKYLGGKSFNKKPTLVVGAG QAGSMLIRQMLKSDEMKEPVLAVDDDEHKRNITITEGVKVQGGKIADIPELVRKYKIKKI IIAIIPTIGQERLKEINNICHMDGVELLKMPNIEDVMSGELEVNQLKKVEVEDLLGRDPVE LMDMISNELTNKTIIVTGAGGSIGSEICROVCNFYPERIILLGHGENSIYLINRELRNR

FGKNVDIVPIIADVQNRARMFEIMETYKPYAVYHAAAHKHVPLMEDNPPEAVRNNILGTK
NTAEAAKNAEVKKFVMISTDKAVNPPNVMGASKRIAEMI IQSLNDETHRTNFVAVRFGNV
LGSRGSVIPLFKSQIEEGGPVTVTHPEMTRYFMTIPEASRLVLQAGALAEKGGEVFLDMG
EPVKIVDLARNLIKLSGKKEDDIRITYTGIRPGEKMFEELMNKDEFVHPEQVFEKIYRGKV
QHMKCNEVEAIIQDIVNDFSKEKIINYANGKKGDNYVR
>G2256_STAAU8325, UNDEFINED PRODUCT 2155251:2156012 REVERSE MW:29362
DQLFFELQSKGFVPIIAHPERNKAIQNLIDILYDLINKGALSQVTTASLAGISGKKIRKLAI
QMIENNLTHFIGSDAHNTEIRPFLMKDLFNDKKLRDYYEDMNGFISNAKLVDDKKIPKR
MPQODYKQKRWFGL
LOCUS 55 (E18)
>G2912 FRG_STAAU8325, UNDEFINED PRODUCT 2797518:2798504 FORWARD MW:37832
SKSYDERFTPDVVAYQQHQGNKFKEHFDLNCYLTLDDVLD SHNIDRGRDVTHTVFNLETK
VLTMGFIDDLLYPDD
LOCUS 56 (F5)
>G1261 FRG_STAAU8325, UNDEFINED PRODUCT 1216923:1217903 FORWARD MW:36061
HTGKVLLVTEDNLEGSIMSEVSAIIAEHCLFDLAPIMRLAAPDVPSM
PFSPVLENEIMMNPEKILNKMRELAEF
>G1262_STAAU8325, UNDEFINED PRODUCT 1217919:1219190 FORWARD MW:46726
MEITMPKLGESVHEGTIEQWLVSVDHIDEYEPLCEVITDKVTAEVPSTISGTITEILVE
AGQTVAITDIIICKIETADEKTNETTEEIQAKVDEHTQKSTKKASATVEQTSTAKQNQPRN
NGRFSPVVFKLASEHDIDLQSVVGSGFEGRVTKKDIMSIVIENGTTAQSDKQVQTKSTSV
DTSSNQSSSEDNSENSTIPVNGVRKAIQNMVNSVTEIPHAWMMIEVDATNLVNTRNHYKN
SFKNKEGYNLTFFAFFVKAVADALKAYPLLNSSWQGNIEIVLHKDINISIAVADENKLYVP
VIKHADEKSIKGIAREINTLATKARNKQLTAEDMQGGTFTVNNTGTFGSVSSMGIINHPQ
AAILQVESIVKKPVVINDMIAIRNMVNLCSIDHRILDGLQTGKFMNHIKQRIEQYTLEN
TNIY
>G1263_STAAU8325, UNDEFINED PRODUCT 1219532:1219978 FORWARD MW:16676
VIELMDMNFDFLYMNGVVEQARNEIESAGYEQLTTAEDVDKVLKQDGTTLVMINSVCGCAG
GIARPAASHALHYDVLPRDLVTTFAGQDKEATQRAREYFEGYAPSSPSFALVKDGKITEM
IERHQIEGHDVMNVINQLQTLFNKYCEER
>G1264_STAAU8325, UNDEFINED PRODUCT 1219995:1220972 FORWARD MW:36973
MLKLNPKYKIGFRTIKTAVGMTLGVIISKLLGLDNYASSAILVVLCIKHTKVHSLQAIISR
LVSCFLVLFLGSAIFSLGQSPVILGIIIVLLFIPLTVVLKVQEGVITSCVILLHVFNASKS
IDAHLIVNETLLLLIGLSIAFTMNLMMPSLDKQLDEYKCKIEQQIADIFSKYSYICEKYE
DTIAIEFEVLLLNKKAKSIAFRDVKNHFVRNENSYYHYFDMREEQVELLMRMKPLIESI
CHKD
LOCUS 57 (F3)

>G0451_STAAU8325, UNDEFINED PRODUCT 410768:412549 FORWARD MW:67976 DLRVLMDAIYELNDHQDLREITKDSKMOKLALAGFLKKIKGTYIESLLKEHKLL
>G0452_STAAU8325, UNDEFINED PRODUCT 412872:414536 FORWARD MW:60909 MEMSVTEVIFSFGLGLGIFLYGLKIMGDGLQASAGDRLRDILNKFTSNPVLGVIAGIVVT ILIQSSSGTTVITIGLVTAGFMTLKQAIGVIMGANIGTTVTAFIIGIDLGEYAMPILALG AFLIFFFKRSKINNIGRILFGFGLFFGLEFMGDAVKPLASLDGFKQLMLDMSTNPILAV IVGAGLTALVQSSSATIGILQEFYQQDLISLNAAPVLLGDNIGTTITAILASLAGSIAA KRAALVHVIFNLIGVIFTIFLPVVIHLISLLQDLWHLKPAMTIAVSHGIFNITNTLIQL PFVAGLAWIVTKLVPGKDIADDYKPOHL
LOCUS 58 (G8)
>G0922_FRG_STAAU8325, UNDEFINED PRODUCT 915062:915931 REVERSE MW:33411 MPPEPEVEHVKRGIEPYVINQKIEHVIFSDKVIIEGKAQGGKETIIEGIELDTFKTLSEGYT ITNVERRSKYIVFQLDNKREQRTLISHLGMAGGFFIVDELEDIMIPNYRKHWHVIFELSN DKKLIYSDIRRFGIEIRNVASVASYPSEFLEIAPEPFSNEALTYLNRHQSNKNKPIKQV IL
>G0923_FRG_STAAU8325, UNDEFINED PRODUCT 915950:918577 REVERSE MW:99163 DELIFEVPKSEVDSFSEFVEEIMENALQLDVPLKVDSSYGATWYDAK
LOCUS 59 (G23)
>G2454_FRG_STAAU8325, UNDEFINED PRODUCT 2344101:2344937 REVERSE MW:32360 MLNEIQILNNGYPMPSVGLGVYKISDEDMTKVVNAIDAGYRAFDYFYDNEASLGRAL KDNGVDREDLFITTKLWNDYQGYEKTFEYFNKSIENLQTDYLDLFLIHWPCADGLFLET YKAMEELYEQGKVKAIGVCNFNVHLEKLMAQSSIKPMVNQIEVHPYFNQOELQ
>G2455_STAAU8325, UNDEFINED PRODUCT 2345162:2346508 REVERSE MW:51133 LETSTIISLIIFILLIALTTVFVGSEFALVKIRATRIEQLADEGNKPAKIVKMKMIANLDY YLSACQLGITVTSGLGLWLGEPTFEKLLHPIFEAINLPTALTTTISFAVSFIIVTYLHV LGELAPKSIAIQHTEKLALVYARPLFYFGNIMKPLIWLNMGSARVIRMFVGNPDQTD MSEEEIKIINNSYNGGEINQTELAYMQNIFSFDERHAKDIMVPRQTMITLNEPFNVDEL LETIKEHQFTRYPTDDGDKDHKGFINVKEFLTEYASGKTIKIANIHELPMISETTRI SDALIRMQRHVHMSLIIDEYGGTAGILTMEILEEIVGEIRDEFDDDEVNDIVKIDNKT FQVNGRVLLDDLTEEFGEFDDSEDIDTIGGWLQSRNTNLQDDYVDTTYDRWVSEIDN HQIIVILNYEFNEARPTIGQSEDEKSE
LOCUS 60 (G29)
>G0139_FRG_STAAU8325, UNDEFINED PRODUCT 137065:137352 REVERSE MW:11080 VMNLAKFSRIKKAGETMATWVAIIFIVAALILGLIGGFLLARKYMMDYLKKNPPINEEML RMMMMQMGQKPSQK

>NONE, UNDEFINED PRODUCT 137582:139645 REVERSE MW:75349
VFYLSFYFKISYNVFDKIEEGKIHKMFNEKDQLAVDTLRALSIDTIEKANSQHPLPMGA
APMAYTLWTRHLNFPQSKDYFNRDRFVLSAGHGSALLYSLHVSLSLELEELKQFRQWG
SKTPGHPEYRHTDGEVETTGPLGQGFAMSVGLALAEDHLAGKFNKEGYNVVDHYTYVLAS
DGDLMEGISHEAASFAGHNKLSKLVVLYDSNDISLDGELNKAFSENTKARFEAYGWNLYL
VKDGNLEEIDKAITTAKSQEGPTIIEVKTITIGFGSPNKAGTNGVHGAPLGEVERKLTFE
NYGLDPEKRFNVSEEVYEIFQNTMLKRANEDSQWNSLLEKYAETYPELAEEFKLAISGK
LPKNYKDELPRFELGHNGASRADSGTVIQAISKTVPSFFGGSADLAGSNKSNVNDATYS
SETPEGKNVWFGVREFAMGAAVNGMAAHGGLHPYGATFFVFSYDLKPALRLSSIMGLNAT
FIFTHDSIAVGEDGPTHEPIEQLAGLRAIPNMNVIRPADGNETRVAWEVALESESTPTSL
VLTRQNLPLVDVPEDVVEEGVRKGAYTVYGSEETPEFLLLASGSEVSLAVEAAKDLEKQG
KSVRVVSMPNWNAFEQQSEYKESVIPSSVTKRVAIEMASPLGWHKYVGTAGKVIAIDGF
GASAPGDLVVEKYGFTKENILNQVMSL
LOCUS 61 (G28/HA7)
>G2610_FRG STAAU8325, UNDEFINED PRODUCT 2494989:2495441
FORWARD MW:17293
DLGMDKDEAKKLFKASESIFKDLKGVKYKVDYKDKKAIEHLDIDYTEVDMKKLNKRLGV
STKENKDISFEKLEKQLKHRGLKEKDKMDDK
>G2611_STAAU8325, UNDEFINED PRODUCT 2495615:2497207 REVERSE
MW:58937
LGGGIVMTFLTVMQFIVNIIVVGFMFLTIVIGLIWLKDKRQSQHSVLRNYPLLARIRYI
SEKMGPELRQYLFSGDNEGKPFSSRNDYKNIVLAGKYNRMTSFGTTKDYQDGFYIQTMTF
PMQRNEISVDNTTLLSTFIYKIANERLFSREEYRVPTKIDPYYSDDHAIKLGEHLKHPF
ILKRIVGQSGMSYGALGKNAITALSGLAKAGTWMNTGEGGLSEYHLKGNGDIFQIGPG
LFGVRDKEGNFSEGLFKEVAQLSNVRAFELKLAQGAQTRGGHMEAEKVNEEIAKIRNVEP
YKTINSPNRYEFIHNAEDLIRFVDQLQQLGQKPVGFKIVVSKVSEIETLVRTMVELDKYP
SFITIDGEGGGTGATFQELQDGVGLPLFTALPIVSGMLEKYGIRDVKVLAASGKLVTPDK
IAIALGLGADFNIAARGMMISVGCIMSQQCHMNTCPVGVATTDAKKEKALIVGEKQYRVT
NYVTSLHEGLFNIAAAGVSSPTEITADHIVYRKVDGELQTIHDYKCLKLIS
LOCUS 62 (H3)
>G2004_STAAU8325, UNDEFINED PRODUCT 1871545:1872954 REVERSE
MW:51401
MGIGRVTQVMGPVIDVRFHEHNEVPKINNALVIDVPKEEGTIQLTLEVALQLGDDVVRTIA
MDSTDGVQRGMDVKDTGKEISVPVGDETLGRVFNVLGETIDLKEEISDSVRRDPPIHRQAP
AFDELSTEVQILETGIVVDLLAPYIKGGKIGLFGGAGVGKTVLIQELINNIAQEHGGIS
VFAGVGERTREGNDLYFEMSDSGVIKKTAMVFGQMNEPPGARMRVALSGLTMAEYFRDEQ
GQDVLLFIDNIFRFTQAGSEVSALLGRMPSAVGYOPTLATMGQLQERITSTTKG
LOCUS 63 (GD10)
>G2900_FRG STAAU8325, UNDEFINED PRODUCT 2781950:2783308
FORWARD MW:51966
DPIFKQEVENLEKEIRNV
>G2901_STAAU8325, UNDEFINED PRODUCT 2783589:2784719 FORWARD
MW:41914

MMEFTIKRDYFITQLNDTLKAISPRITLPIITGIKIDAKEHEVILTGSDSEISIEITIPK
TVDGEDI VNISETGSVVLPGRRFFVDIIKKLPKGDVKLSTNEQFQTLITSGHSEFNLSGLD
PDQYPLLPQVSRDDAIQLSVKVLKNVIAQTNFAVSTSETRPVLTGVNWLIIQENELICTAT
DSHRLAVRKLQLEDVSENKNV IIPGKALAE LNKIMSDNEEDIDIFFASNQVLFKVGNVNF
ISRLLEGHYPDTRLPENYEIKLSIDNGEFY
LOCUS 64 (F5)
>G1261 FRG_STAAU8325, UNDEFINED PRODUCT 1216923:1217903 FORWARD MW:36061
HTGKVLLVTEDNLEGSIMSEVSAIIAEHCLFDLDAPIMRLAAPDVPSM
PFSPVLENEIMMNPEKILNKMRELAEF
>G1262_STAAU8325, UNDEFINED PRODUCT 1217919:1219190 FORWARD MW:46726
MEITMPKLGESVHEGTIEQWLVSVDHIDEYEPLCEVITDKVTAEVPSTISGTITEILVE
AGQTVAITDIIICKIETADEKTNETTEEIQAKVDEHTQKSTKKASATVEQTSTAKQNQPRN
NGRFSPVVFKLASEHDIDLQVVGSGFEGRVTKKDIMS VIENGTTAQSDKQVQTKSTSV
DTSSNQSSSEDNSENSTIPVNGVRKAI AQNMVNSVTEIPHAWMMIEVDATNLVNTRNHYKN
SFKNKEGYNLTFFAFFVKAVADALKAYPLLNSSWQNEIVLHKDINISIAVADENKLYVP
VIKHADEKSIKGIAREINTLATKARNKQLTAEDMQGGTFTVNNTGTFGSVSSMGIINHPQ
AILQVESIVKKPVVINDMIAIRNMVNLCISIDHRILDGLQTGKFMNHIKQRIEQYTLEN
TNIY
>G1263_STAAU8325, UNDEFINED PRODUCT 1219532:1219978 FORWARD MW:16676
VIELMDMNF DLYMNGVVEQARNEIESAGYEQLTTAEDVDKVLKQDGTTLVMINSVCGCAG
GIARPAASHALHYDVL PDLRVTVFAGQDKEATQRAREYFEGYAPSSPSFALVKDGKITEM
IERHQIEGHDVMNVINQLQTLFNKYCEER
>G1264_STAAU8325, UNDEFINED PRODUCT 1219995:1220972 FORWARD MW:36973
MLKLNPKYKIGFRTIKTAVGMTLGVIISKLLGLDNYASSAILVVLCKIKHTKVHSLQAIISR
LVSCFLVFLFGSAIFSLLGQSPIVLGIIVLLFIPLTVVLKVQEGVITSCVILLHVFNASKS
IDAHLIVNETLLLLIGLSIAFTMNLMMPSLDKQLDEYKCKIEQQIADIFSKYSYICEKYE
DTIAIEFEVLLLNIKKAKSIAFRDVKNHFVRNENSYYHYFDMREEQVELLMRMKPLIESI
CHKD
LOCUS 65 (F110)
>G2848_STAAU8325, UNDEFINED PRODUCT 2734525:2735082 REVERSE MW:21969
LKDKIIDNAITLTFSEKGYDGTTLDDIAKSVNIKKASLYYHFD SKKSIYEQSVKCCFDYLN
NIIMMNQNSNYSIDALYQFLFEFIFDIEERYIRMYVQLSNTPEEFSGNIYGQIQDLNQS
LSKEIAKFYDESKIKMTKEDFQNLILLFLESWYLKASFSQKFGAVEESKSQFKDEVYSL
NIFLKK
>G2849_STAAU8325, UNDEFINED PRODUCT 2735246:2736481 FORWARD MW:47752
LQFFNLLFYFVFMSTYWIWVGSIIYFYFTREIRYSLNKKPDINVDELEGITFLLACYNES
TIEDTLSNVLALYKYEKKEIIIIINDGSSDNTAELIYKIKENNDFI FVDLQENRGKANALNQ
GIKQASYDYVMCLDADTIVDQDAPYYMIENFKHDPKLGAVTGNPRIRNKSSILGKIQTIE
YASLIGCIKRSQTLGAVNTISGVFTLFKKS AVVDVGYWDTDMITEDIAVSWKHLHGRYR

IKYEPLAMCWMVLVPETLGGLWKQVRWAQGGHEVLLRDFSTMTKTRFPLYILMFEQIIS ILWVYIVLLYLGYLFITANFLDYTFMTYSFSIFLLSSFTMTFINVIOFTVALFIDSRYEK KNMAGLIFVSWYPTVYWIINAAVVLVAFPKALKRKKGGYATWSSPDRGNTQR
>G2850_STAAU8325, UNDEFINED PRODUCT 2736448:2736750 FORWARD MW:11783 MVKPRQREYPTLKSSLNIVRETALIAISCVFWIYCLVLLVYIGTIFEIHDESINTIRVA LNIENTEILDIFETMGIFAIIFVFFFTISILIQKWQRGRES
>G2851_STAAU8325, UNDEFINED PRODUCT 2736729:2737619 FORWARD MW:34958 MAERKRIVKYRKFIILVLSILILPVSTLDGHHIANADDDSPKKLYKENSALALNYHRV RKANFLNNFIYFFSSSKEIKNYSVSQSQFESQIKWLKSHDAKFLTLKEFLYKKGKFKPK RSVWINFDDMDETIYENAYPILKKYKIPATGFIITGHVGEENFHNLDMISKKELKEMYKT GLWEFETHDHLNLSKNNKSKLMKASEATI IKDLNKSEKYLTKNFKKSQKTIAYPYGLM NDDKLPVIKKAGLKYGFSLEEKAVTPNSNDYYIPRILISDDAFEHLIKRWDFHEKD
>G2852_STAAU8325, UNDEFINED PRODUCT 2737609:2738658 FORWARD MW:41344 MKKIRLELVYLRAIICAIITHTLLTQITLKHENMEGGSLVLQFYIRNIVIFGTPCFIIL SQLLTTLNYQKVTRYRLTTRVKYILIPYILMGLFYSSYSESLTDSSFNKQFIENVLLGQW YGYFIVIMQFFILSYIIFKINYNLFNSKILLLSFILQOSFLYYFTNNTAFHDTVLHYY PLSENTIIFGWIFYFFLGAYMGYNYERVLNFLERYLVIMIVLAVATYFVFIALANGDYWN VTSFSYSLTPYNSIMFIVILGICTHFKTMLFNTIQMISAFSFFIYLLHPIILDLSLFAYTN IFEDNTMVFLAISLLFILGLCIGVGMILREFYIFRFIIGKQPYKLNINAY
>G2853_FRG STAAU8325, UNDEFINED PRODUCT 2739111:2741162 REVERSE MW:77120 DPIVLVHGFNGFTDDINPSVLAHYWGGNKMNIRODLEENGYKAYEASISAFGSNYD RAVELYYYIKGGRVDYGAHAAGYGHYRGTYEGIYKDWKPGQKVHLVGHSMGGQTIRO LEELLRNGNREEIEYQKKHGGEISPLFKGNHDNMISSITTLGTPHNGTHASDLAGNEALV RQIVFDIGKMFNGKNSRVDFGLAQWGLKQKPNEYSIDYVKRVKQSNLWKSNDNGFYDLTR EGATDLNRKTSNLNPNIVYKTYTGEATHKALNSDRQKADLNMFFPFVITGNLIGKATEKEW RENDGLVSVISSQHPFNQAYTKATDKIQKGIWQVTPTKHDWDHVDVFGQDSSDVTVRTREE LQDFWHHLADDLVKTEKLTDTKQA
LOCUS 66 (E1)
>G0406_STAAU8325, UNDEFINED PRODUCT 370166:372094 REVERSE MW:70979 MTTTFIISYIILALIIVGVINLFLIRSRKKGKRQOKEQQFTTRQSNQSKFKASDLDKTTD QSTQRMTHEELRVDNQDDHSQVSLNGYTKGSEKDQEAFTNNKDEEAVAANKPESEYKVN EKIKKEHKNFIFGEGVSRGKILAALLFGMFIAILNQTLNVALPKINTEFNISASTGQWL MTGFMLVNGILIPITAYLFNKYSYRKLFLVALVFTIGSLICAISMNFPIMMVGRVLQAI GAGVLMPLGSIVITTIYPPEKRGAMGTMGIAMILAPAIGPTLSGYIVQNYHWNVMFYGM FIIGIIAILIGFVWFKLYQYTTNPKADIPGIIIFSTIGFGALLYGFSEAGNKGWGSVEIET MFAIGIIFIILFVIRELRMKSPMLNLEVLKFPTFTLTIIINMVVMSLYGGMILLPIYLQ NLRGFSALDSGLLLPGSLIMGLLPGFAGKLLDTIGLKPLAIFGIAVMTYATWELTKLNM DTPYMTIMGIYVLRSGMAFIMMPMVTAINALPGRASHGNAFLNTRQLAGSIGTAIL VTVMTTQTTHLSAFGEELDKTNP
>G0407_STAAU8325, UNDEFINED PRODUCT 372110:372754 REVERSE MW:23024 MPQKGTIAKLDGMEGSMVQAGNPIAYAYNL

DDLYVTANIDEKDIKQVEVGKDVDTIDGQKASIKGKVD SIGKATAASFSLMPSSNSDGN YTKVSQVIPVKITLESEPSKQVPGMNAEVIKHKH
LOCUS 67 (F119)
>G1831_FRG_STAAU8325, UNDEFINED PRODUCT 1723090:1723806 REVERSE MW:27770 MEHTTMKMTAIKASLALGILATGTITSLHQTVNASEHKAKYENVTKDIFDLRDYYS GAS KELKNVTGYRYSKGGKHYLIFDKNRKFTRVQIFGKDIERFKARKNPGLDIFVVKEAENRN GTVFSYGGVTKKNQDAYDYINAPRFQIKRDEGDGIATYGRVHYIYKEEISLKELDFKLR QYLIQNF
>G1832_STAAU8325, UNDEFINED PRODUCT 1724158:1725096 REVERSE MW:34671 MEHTTMKITTIAKTSLALGLLTGVTITTTQAANATTLSSSTKVEAPQSTPPSTKIEAPQS KPNATTPPSTKVEAPQQTANATTPPSTKVTPPSTNTPQPMQSTKSDTPQSPTTKQVPTE INPKFKDLRAYYTKPSLEFKNEIGIILKKWTTIRFMNVVPDYFIYKIALVGKDDKKYGE VHRNVDVVFVLEENNYNLEKYSVGGITKSNKKVDHKAGVRITKEDNKGITISHDVSEFKI TKEQISLKELDFKLRKQLIEKNLYGNVSGSKIVIKMKNGGKYTFELHKKLQENRMADVI DGTNIDNIEVNIK
>G1834_STAAU8325, UNDEFINED PRODUCT 1725193:1725327 REVERSE MW:5264 LFVKVAFCLCLKSDETSNVPSVESHQNHFYLTNIMDFLIYLTMIQI
>G1835_STAAU8325, UNDEFINED PRODUCT 1725449:1726531 REVERSE MW:40775 LEHTIMKMRITIAKTSLALGLLTGAI TVTTQSVKAEKIQSTKVDKVPTLKAERLAMINIT AGANSATTQAANTRQERTPKLEKAPNTNEEKTSASKIEKISQPKQEEQKTLNISATPAPK QEQSQTTESTTTPKTKVTPPSTNTPQPMQSTKSDTPQSPTIKQAQTDMPKYEDLRAYY TKPSFEFEKQFGFMLKPWTTVRFMNVIPNRFIYKIALVGKDEKKYKDGPDNIDVFIVLE DNKYQLKKYSVGGITKTNSKKVNHKVELSITKKDNQGMISRDVSEYMITKEEISLKELD KLRKQLIEKHNLGYNMGS GTIVIKMKNGGKYTFELHKKLQEHMADVIDGTNIDNIEVNI K
>G1837_STAAU8325, UNDEFINED PRODUCT 1726810:1727562 REVERSE MW:28926 DYDFFPFKIDKEAMSLKEIDFKLRKYLIDNYGLYGEMSTGKITVKKKYKGKYTFELDKKLQE DRMSDVINVT IDRIEIKVIKA
LOCUS 68 (G27)
>G0516_STAAU8325, UNDEFINED PRODUCT 482272:486597 REVERSE MW:163057 VVIVLAMTEQQKFVLAQIKISNQLDAEILNSGELTRIDVSNKNRTWEFHITLPQFLAH EDYLLFINAIEQEFKDIANVTCRFTVTNGTNQDEHAIKYFGHCIDQTALSPKVKGQLKQK KLIMSGKVLKVMVSNDIERNHFDKACNGSLIKA FRNCGFDIDKII FETNDNDQEQNLASL EAHIQEEDEQSARLATEKLEKMAEKAKQQDN NESAVDKCQIGKPIQIENIKPIESIEE EFKVAIEGVIFDINLKEKSGRHIVEIKVTDYTDLSVLKMFTRKNKDDLEHFKALSVGKW VRAQGRIEEDTFIRDLVMMMSDIEEIKKATKKDKAEKRVFHLHTAMSQMDGIPNIGAY VKQAADWGHPAIAVTDHNVVQAFPDAAAAEKHGKMIYGMGMLVDDGVPIAYKPQD VV LKDATYVVFVDTTGLSNQYDKII ELAAVKVHNGEIIDKFERFSN PHERLSETIINLTHI

TDDMLVDAPEIEEVLTEFKEWVGDAIFVAHNASFDMGFIDTGYERLGFPGSTNGVIDTLE
LSRTINTEYKGHGLNFLAKKYGVELTQHHRAIYDTEATAYIFIKMVQQMKELGVLNHNEI
NKKLSNEDAYKRARPSHVTLLIVQNQQGLKNLFKIVSASLVKYFYRTPRI PRSLLDEYREG
LLVGTACDEGELFTAVMQDQSQVEKIAKYDFIEIQPPALYQDLIDRELIRDITETLHEI
YORLIHAGDTAGIPVIATGNAHYLFEHDIARKILIASQPGNPLNRSTLPEAHFRITDEM
LNEFHFLGEEKAHIEIVVKNTNELAD
LOCUS 69 (H110)
>G2217 FRG STAAU8325, UNDEFINED PRODUCT 2108154:2110211 FORWARD MW:74420
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FWFEFGSWKNAAGEIIHGDRIFIEQIREGAHLTAGKFMQGEFPVMMFGLPAAALAIYHT
AKPENKKVVAGLMGSAALTSFLTGITTEPLEFSFLFVAPLLFFIHAVLDGLSFLTLYLLDL
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>G1782 STAAU8325, UNDEFINED PRODUCT 1672236:1672334 REVERSE MW:3948
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>G1783_STAAU8325, UNDEFINED PRODUCT 1672737:1673480 REVERSE MW:28585 IGNDVASDSIYDYLEKVLNL NISYSSKSITFEPFDEQAYQLFGDVSVAYSATVRSIVYLENTMPFQYNISKHLANEFKFN DFSRRRIK
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LOCUS 79
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LOCUS 80
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SURFACE PROTEIN
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MW:36281

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LOCUS 94
>G2374_STAAU8325, UNDEFINED PRODUCT 2260182:2261696 REVERSE MW:56424 MAKKPTALIILDGFANRESEHGNAVKLANKPNF
>G2375_STAAU8325, UNDEFINED PRODUCT 2261702:2262559 REVERSE MW:30982 DQLKSVVIAYEPIWAIGTGKSSTSEDANEMCAFVRQTIADLSSKEVSEA TRIQQYGGSVKPNNIKEYMAQTDIDGALVGGASLKVEDFVQLLEGAK
LOCUS 95
>G2535_STAAU8325, UNDEFINED PRODUCT 2417067:2417516 FORWARD MW:16668 ILNFIFSFLASMFVCVIFDAPRKLYLSCGFVGTGGMVYTLFFNGFNVHTIYSSFFG SLALGLLSHYMARKQKEPAIIFMVTGIIPLVPGGLAYDATKNLVLLNFSTAINMTLEVTL IAGAIALGLLFADQISKLVSGFVKSPKRL
>G2537_STAAU8325, UNDEFINED PRODUCT 2417664:2419181 REVERSE MW:55776 LGIEYLRGEFLFMEKKNKQIDRGDLKQNLSEKFVWAIAYGSCIGWGAFILPGDWIKQSGP IAASIGIVIGALLMILIAVSYGALVERFPVSGGAFASFSLSFGRYVSFFSSWFLTFGYVC VVALNATAFSLLVKFLLPDVLNNGKLYTIAGWDVYITEIIATVLLL VFMLVTIRGASVS GSLQYYFCVAMVIVVLLMFFGSFFGNFALENLQPLAEPKGLVSVIVVIVSVAPWAYVG FDNIPQTAEFNFAPNKTFLIVYSLAASLTIVVMILYTGWLSTSHQSLNGQLWLTGAV TQTAFGYIGLVLAIAIMMGIFTGLNGFLMSSSRLLFSMGRSGIMPTMFSKLHSHKYKTPY VAIIFLVGVSLIAPWLGRTALTWIVDMSSTGVSIAYFITCLSAAKLFSYNKQSNYAPVY KTFAIIGSFVSFIFLALLLVPGSPAALTAPSYIALLGWLIIGLIFFVIRYPKLNMDNDE LSRLILNRSENEVDMDIEEPEKEKTK
G2538?
LOCUS 96
>G2914_STAAU8325, UNDEFINED PRODUCT 2799733:2801715 FORWARD MW:74379 DPTLRRVMNEIDKKPELRERFITSDDAWDMMTSKTTV VIVDTHKPELVLDENVLNKANRKVVIDH
LOCUS 97
>G0929_STAAU8325, UNDEFINED PRODUCT 926398:927756 FORWARD MW:50481 IGIPFAAGLINFVVLTAASSCNSGIF SNSRMLFGLSSQQAPPNFSTKNKYGVPHVAIFASSALLLVAALLNYIFPDATKVFTYVT

TISTVLFLVVWGLII IAYINYSRKNPDLHKNATYKLLGGKYMGYLIFVFFI FVFGLLFIN VDTRRAIFYFIPIWFILLAFMYLRYKRIAASNK
>G0930_STAAU8325, UNDEFINED PRODUCT 927795:928619 REVERSE MW:32642 MRMKEDHMKNQQLKPGYNLQIATNSQFVLSYDLFQNPTDTRTLIPFLTMIQNTFGYLPEY IVADAGYGSEQNYMAIIDDFNKTPLITYGMFIKDTRKFSGIFNTQNWKYDELNNEFIC PNNKRIGFKRYAYRNDRYGFKRDFKLYECDDCSSCSLRHQCMKPNSKSNNKIMKNYNWEY FKVOINQKLSEPETKNIYSQRKIDVEPAFGFMKAILGFTRMSVRGINKVKRELGFVLMAL NIRKIAAQRVHYKIHKKADFYQIINRNQLFYIA
>G0931_STAAU8325, UNDEFINED PRODUCT 928619:929443 REVERSE MW:32667 MYKIYNMTQLTLPietsVRIPQNDISRYVNEIVETIPDSEFDEFRRHRGATSYPHKMMLK IILYAYTSVSFSGRIEKLHDSIRMMWLAQDOTPSYKTINRFRVNPNTDALIESLFIQF HSQCLKQNLIDNNSIFIDGTKEANANRYTFVWKKSIQNHESKLNENSKTYRDLVEEKI IPEIKEDGSDLTIEEIDLIGSHLDKEIEDLNHSIENEDCAQIRKQTRKKITEIKKFKKK FDDYSERKNKYEEQKSILKDRNSFSKTDLIMMQLL
>G0932_STAAU8325, UNDEFINED PRODUCT 930087:931841 REVERSE MW:63103 SVVGTTLVAETVKDLEGKDLSDKVIVTNSIDETFVPYVEKALGLITEENGITSPS AIVGLEKGIP TVGVGEKAVKNISNNMLVTIDAAQGKIFEGYANVL
LOCUS 98
>G2804_STAAU8325, UNDEFINED PRODUCT 2682166:2682924 REVERSE MW:29096 MAYISLNYHSPTIGMHQNLTVILPEDQSFFNSDTTVKPLKTM LHLGLSSDET T Y M R Y T S IERYANEHKLAVIMPND
>G2805_STAAU8325, UNDEFINED PRODUCT 2683043:2685673 REVERSE MW:93576 DQTPVQEANSQVDNKTNDANSIATNSELKNSQTLDLPQSSPQTIS NAQGT SKPSVR TRAVRSLAVAEPV VNAADAKGTNVNDKV TASNF KLEKTTFD PNQSGNTF MAANFTVTDKVKSGDYFTA KL PDSL TGNGDV DYS NS NNTMPIADI KSTNGDV VAKATYDI LTKTYTFVFTDYVNKENINGQFSL PLFTDRAPKSGTYDANINI ADEM FN NK ITYNYS SPIAGIDKPNGANISSQI IGVD TAS G Q NTY K Q T VFV NP K Q RV LG NT W V Y I KGYQDKIEES SGKVSATDTKLRI FEVNDTSKLSDSY Y ADPNDS NL KEV TD QFNRIYYEH P NVASI KF GD ITKTYVVLVEGHYDNTGKNLKTQVIQENVDPVTNRDYS IFGWNN EN VRYGGGSADGD SA VNP KDPT PGPPVD PEPS DP EPEPT PDPEPS DP EPEPS DP DP DS SD SG SDS GS SDS SESD SDS SDS SDS SDS SEDS SESED SESED SDS SRVTPPNNEQKAPS NPKGEVNHSNKVSKQHKT DALPE TGDKSENT NATLF GAMMAL LGSLLL FRKR KQDHKEKA
LOCUS 99
>G2284_STAAU8325, UNDEFINED PRODUCT 2182330:2183307 REVERSE MW:37252 VEDLERVLITGGAGFIGSHLVDDLQQDYDVYVLDNYRTGKRENIKSLADDHV FELDI REY DAVEQIMKTYQFDYVIHLAALVSVAESVEKPILSQEIINV VAT LR LL EI IK

>G2285_STAAU8325, UNDEFINED PRODUCT 2183380:2183499 REVERSE MW:4917 MHQLKALLVLTHPRYYKTSQKHYYLIYLNKNSQSYLILFL
>G2286_STAAU8325, UNDEFINED PRODUCT 2183646:2184428 REVERSE MW:27575 IFMTNNKVALVTGGAQGIGFKIAERLVEDGFKVAVVDFNEEGAKAAALKLSSDGTKAIA IKADVSNRDDVFNAVRQTAAQFGDFHVMVNNAGLGPTTPIDTITEEQFKTVYGVNVAGVL WGIQAAHEQFKFNHGGKI INATSQAGVEGNPGLSLYCSTKFAVRGLTQVAAQDLASEGI TVNAFAPGIVQTPMMESIAVATAEEAGKPEAWGWEQFTSQIALGRVSQPEDVSNVVSFLA GKDSYITGQTIIVDGGMRFR
LOCUS 100
>G1465_STAAU8325, UNDEFINED PRODUCT 1429687:1432446 REVERSE MW:105241 VKKMDYKETLLMPKTD FPMRGGLPNKEPQIQEKWDAEDQYHKALEKNKGNETFILHDGPP YANGNLHMGHALNKILKDFIVRYKTMQGFYAPYVPGWDTHGLPIEQALTKKGVDRKKMST AEFREKCKEFALEQIELQKKDFRRLGVRGDFNDPYITLKPEYEEAQIRIFGEMADKGLIY KGKKPVYWSPPSESSLAEEIEYHDKRSASIYVAFDVKDDKGVVDADAKFI IWTTTPWTI PSNVAITVHPELKYGOYNVNGEKYIIAEALSDAVAEALDWDKASIKLEKEYTGKELEYV AQHPFLDRESLVINGDHVTTDAGTGCVHTAPGHGEDDYIVGQKYELPVISPIDDKGVFTE EGGQFEGMFYDKANKAVTDLLTEKGALLKLDFTHSYPHDWRTKKPVIFRATPQWFASIS KVRQDILDAIENTNFKNWGWKTRIYNMVRDRGEWVISRQRVWGVPLPVFYAENGEIIMTK ETVNHVADLFAEHGSNIWFEREAKDLLPEGFTHPGSPNGTFTKETDIMDVWFDSCSSHRG VLETRPELSFPADMYLEGSDQYRGWFNSSITTSVATRGVSPYKFLLSHGFMVDGEGKMS KSLGNVIVPDQVVKQKGADIARLWVSSTDYLDVRLSDEILKQTSADVYRKIRNTLRFMLG NINDFNPDTDSIPESELLEVDRYLLNRLREFTASTINNYENFDYLNITYQEVQNFINVLS NFYLDYGDILYIEQRDISHIRRMQTVLYQILVDMTKLLAPILVHTAEVWSHTPHVKEE SVHLADMPKVVEVD
LOCUS 101 (GF7)
>G1243_STAAU8325, UNDEFINED PRODUCT 1200372:1201841 FORWARD MW:54782 DQVQGSLEIIYSLQEELKEITGMDEVTLQPAAGAHGEWTALMIFKAYHENNGEGHRDEVIVP DSAHGTNPASA SFAGFKSVTVKSNERGEVDIDDLKRVVNENTAAIMLTNPNTLGIFEKNIMEIREIVHNAG GLLYYDGANLNAIMDKVRPGDMGFDVHLNLHKTFTGPHGGGGPGSGPVGVVKELASYLP KPMVIKDGDKFKYDNDIKNSIGRVKPFYGNFGIYLRAYTYIRTMGATGLKEVSEAAVLNA NYIKARLSKHFEIPYKQYCKHEFVLSGVRQKEFGVRTLDMAKRLLDFGVHPPTIYFPLNV EEGMIEPTETESKETLDYFIDTLISIAEEAKNDPKVLEAPHTTVIDRLDEATAARKPI LKFENLKQEK
LCOUS 102
>G2529_FRG_STAAU8325, UNDEFINED PRODUCT 2410504:2411484 REVERSE MW:36804 LIKSGKARAHTNIALIKYWGKKDEALIIPMNNSISVTLEKFYTETKVTFNDQLTQD
>G2530_STAAU8325, UNDEFINED PRODUCT 2411492:2412409 REVERSE

MW:32919
MTRKGYGESTGKIILIGEHA VTFGEPAIAVPFNAGKIKVLEAESGNYSSIKSDVYDGM
LYDAPDHLKSLVNRFVELNNITEPLAVTIQTNLPPSRGLGSSAAVAVAFVRASYDFLGKS
LTKEELIEKANWAEQIAHGKPSGIDTQTIVSGKPWWFQKGHAETLKTLSLDGYMVVIDTG
VKGSTRQAVEDVHKLCEDPQYMSHVKHIGKLVLRASDVIEHHNFEALADIFNECHADLKA
LTVSHDKIEQLMKIGKENGAIAGKLTGAGRGGSMILLAKDLPTAKNIVKAVEKAGAAHTW
IENLGG
>G2531 FRG_STAAU8325, UNDEFINED PRODUCT 2412999:2413832
REVERSE MW:31735
NAIVRNSGGLGVVLDQGVNLISLMFKGQTETTIDEAFTV
MYLLISKMFENENV DIDTMEIEHSYCPGKFDLSIDGKKFAGISQRRVRGGIAVQIYLCVE
GSGSERALMMQTFYEHALKGEVTKFKYPEIEPSCMASLETLLNKTITVQDVMFLLLYAIK
DLGGVLNMTPI TQEEWQRYDTYFDKMIERNKKMIDQMQ
LOCUS 103 (GF11)
>G2235 FRG_STAAU8325, UNDEFINED PRODUCT 2133494:2134471
REVERSE MW:36941
VTMKRLSIIVIIGIFIITGCDWQRTSKERSKNAQNQQVIKIGYLPITHSANLMMTKKLLS
QYNHPKYKLELVKFNNWPDLM DALNSGRIDGASTLIELAMKSKQKGSNIKAV ALGHHEGN
VIMGQKGMHLNEFNNGDDYHFGIPHRYSTHYLLLEELRKQLKIKPGHFSYHEMSPAEMP
AALSEHRITGYSVAEPFGALGKLGKGT LKHGDDVIPDAYCCVLVLRGELLDOHKDVAQ
AFVQDYKKS GFKMND
>G2236_STAAU8325, UNDEFINED PRODUCT 2134482:2135219 REVERSE
MW:28095
MIKIQQLQH HFGSHKVIHNFNLDISKGEIVTFIGKSGCGKSTLLNIIGGFIHPSSGRVII
DNEIKQQPSPDCLMLFQHHNLLPWKTINDNIRIGLQQKISDEEINAQLKLV DLEDRGKHF
PEQLSGGMKQ RVALCRAHVHKPNVILMDEPLGALDAFTRYKLQDQLVQLKHK TQSTIILV
THDIDEAIYLSDRIVLLGEGCNIISQYEITASHPRSRNDSHLLKIRNEIMETFALNHQV
EPEYYL
LOCUS 104 (GF12)
>G2828 FRG_STAAU8325, UNDEFINED PRODUCT 2715541:2717115
REVERSE MW:59929
VKMMPRKFRVLQIGGDDLEPIFQHKKGVSWDYFDIGLFEFDSGYVEAIEAIVEAEGRFDF
IYIQAPYSETLTNLLQMISEPYNTYVDESFW SVEYEQDENVQKYVVQPLHYRNIERNNK
LEAVSFSGQYGD KVS PKLALVHPNFKGDV VYQGNSELTLSGEFGKEFKPIASWQNNLVYD
KDKVIQIWPEFDIDGAVELQYTFRLIQTGADGALIEQIVLTDDMLDSPLEIPAKPFDAYI
SVTVKARGNGTVHLGPIHKRWSRLDMGQFLLGGSRFVDSQRQEFIIYFHPGDMKPPLNVY
FSGYRTAEGFEGYMMKRMNAPFLLIGD
>G2829 FRG_STAAU8325, UNDEFINED PRODUCT 2717099:2718649
REVERSE MW:61259
DQDDIIAVKTIHAEDVVEALRTLRLVIDMSKEPDLYLQIS AISAGIPQINGQQT DYVSDYD
NGRIINTVDELDDALNYLFY LKNWNYAYAYSLKLIDAYASKNIINQLDE LIEGENDAT
LOCUS 105 (E18)
>G2912 FRG_STAAU8325, UNDEFINED PRODUCT 2797518:2798504

FORWARD MW:37832
SKSYDERFTPDEVVAYQQHQGNKFKEHFDLNCYLTLDDVLDShNIDRGRTDVTHVFKNLETK VLTMGFIDDLlyPDD
LOCUS 106 (E101)
>G1083 FRG_STAAU8325, UNDEFINED PRODUCT 1057165:1058778 REVERSE MW:57664
DREKLQERLAKLAGGVAVIKVGAASETELKERKLRIEDALNSTRAAVEEGIVAGGGTALVNV YQKVSEIEAEGDIETGVNIVLKALTAPVRQIAENAGLEGSVIVERLKNAEPGVGFNAATN EWNMLE
LOCUS 107 (E110)
>G0975_STAAU8325, UNDEFINED PRODUCT 975981:977042 REVERSE MW:40300
MKLQTTYPSNNYPIYVEHGAIDHISTYIDQFDQSFILIDEHVNQYFADKFDDILSYENVH KVIIIPAGEKTKTFEQYQETLEYILSHHVTRNTAIIAVGGGATGDFAGFIAATLLRGVHFI QVPTTILAHDSVGGKVGINSKQGNLIGAFYRPTAVIYDLVFLKTLPPFEQILSGYAEVY KHALLNGESATQDIEQHFKDREILQSLNGMDKYIAKGIETKLDIVIADEKEQGVKFLNL GHTFGHAVEYYHKIPHGHAVMVGIIYQFIVANALFDSKHDINHIIQYLIQLGYPIDMITD LDFETLYQYMLSDKKNDKQGVQMVLIROFGDIVVQHVQDQLTLQHACEQLKTYFK
LOCUS 108 (E125)
>G2809_STAAU8325, UNDEFINED PRODUCT 2689308:2690324 REVERSE MW:38103
VKIMTEIQKPYDLKGRSLKESDFTKAEFEGFLIDFAITLKEYKKNIGIKHHYLSGKNIALL FEKNSTRTRAAFTVASIDLGAHPEFLGKNDIQLGKKESVEDTAKVLGRMFDGIEFRGFSQ QAVEDLAKFSGVPVWNGLTDDWHPTQMLADFMITIKENFGYLEGINLTYVGDGRNNIAHSL MVAGAMLGVNVRICTPKSLNPKEAYVDIAKEKASQYGGSVMITDNIAEAVENTDAIYTDV WVSMGEESEFEQRINLLKDYQVNQQMFDLTGKDSITFLHCLPAFHDTNTLYGQEIYEKYG LAEMEVTDQIFRSEHSKVFDQAENRMHTIKAVMAATLGS
>G2810_STAAU8325, UNDEFINED PRODUCT 2690351:2691583 REVERSE MW:46915
DRDCPFNIEGGDELVLSDVLAIGVSSERTSAQAIEKLARRIFENPQATFKKVVAIEIPTSR FMHLDTVFTMIDYDKFTMHSAILKAEGNMNIFIIEYDDVNKDIAIKQSSHLKDTLEDVLGID DIQFIPTGNGDVIDGAREQWNDGSNTLCIRPGVVVTYDRNYVSNDLLRQKGIVIEISGSEL VRGRGGPRCMSQPLFREDI
LOCUS 109 (F101)
>G1098 FRG_STAAU8325, UNDEFINED PRODUCT 1068360:1069841 REVERSE MW:57928
MTEWTRERYQRIEDVDTEYFKTLKQQVDQSKFRQQFHIQPETGLLNDPNGLIFYKGKYY VSHQWFPLGAVHGLKYWYNYTSDDLINFKAEGPIILNPDTKYDSHGVSYSASFAYNGHLYY MYTGNHRDNHWQRHASQMIARLKEDGSVEKFPKPVISQQPEGYTSHFRDPKVFKYDEKYY AIIQAQNNDOQGRLLLYNTEDIINWHYLGEINTELDGFGYMWECPDYFNVDNQDVILICP QGI

>G1099_STAAU8325, UNDEFINED PRODUCT 1069993:1070940 REVERSE MW:35500
MKNISDIAGVSKSTVSRFLNNGSVSKKTSEKLTIRIIAEHDYQPNQFAQSLRARQTHL
IGAIIPRMNSYAVDETIKGLAKQCQKYESQLILNYTGLNIEAEIQALETLARSKVDGIVL
MATDITERHIEVINKMNVPIVIVGQQHEQLHSIVHDDYKAGQIIGEWIGQQGYQQVEVFS
VSEKDIAGVIHRKRGLLDQLAKYQIKPNIHETNFTYVEAQKDVANVLENVEQVDAVVGAT
DTIALAAYKYYSDDKDVMPKHQIYGFGGDPMTQLVSPSIKTIHYNIFEAGQCAMEEIQQM
LKKQDMPYSVTVDVNI
>G1100_STAAU8325, UNDEFINED PRODUCT 1071126:1072409 REVERSE MW:46849
LSDYEEKKGVSVMNLNDTIFMFLCTLLVWLMTPGLSLFYGGLVQSKNALNTVMQSMAAIV
LVTFWWITVGTISFGNGNLWFGNWEYTFNLHVGFATQEDISPHIPFALFQMMFCTI
AISILSGSIAEKMKFIPYLLFVVIWLTALVYSPVAHVWGGGWINKLGVLDFAGGTVVHIT
SGVSGLVLAIMIGKGNKHSESTPHNLIITLIGGIFVWIGWYGFNVGSAFTFDNIAMLAFT
NTVISASAGAIGWLILEYIFKKTSLGLLLGALAGLVVITPAAGYVTYLSATIMALIGG
ICCYIVINYIKVKKYHDALDAFGIHGVGGIIGAVLTAVFQSKKANPDIENGFIYTGDIH
IILVQILCVTAVVIFSIVMTFLIAKVIKLITPLSVTEQETNIGLDKIVHGEHAYFEGELN
RFNKHIRY
>G1101_STAAU8325, UNDEFINED PRODUCT 1072584:1072829 REVERSE MW:9040
VIGKEIIMIHELGTVMVCPFPLIEAQKKMATLQSGDELKIDFDCTQATEAIPNWAAEN
GYPVTNYESQIDNASWTITIQKV
LOCUS 110 (F113)
>G1446_STAAU8325, UNDEFINED PRODUCT 1408055:1410469 REVERSE MW:92806
VAIMIAKVIVDVASKSVDYKFDYIIEQLESVIQPGVRVIVPFGPRTIQGYVMEVTAEPD
AQLDVSKLKKIIEVKDIQPELTSELIALSEWMGSGTHVIKRISMLEVMLPSAIKAKYKKA
KMKDDIELPSALLQKFDKHGYYYKDAQKNNDIQLLMKLLKDDIVEEKTILTQNTTKTK
RAVRVIEGYHPDEVLALEKVIKQYDLYAYLSEEQHKTIFLTIEDMGFSKSSLDGLIKK
GYVEKYDAVVERD
LOCUS 111
G2820
>G2820_STAAU8325, UNDEFINED PRODUCT 2704341:2706197 FORWARD MW:69253
MPKNKILIIYLLSTTLVLPTLVSPATAYADTPQKDTTAKTTSHDSKKSNDDETSKDTTSKDI
DKADKNNTSNQDNNDKKFKTIDDSTSDSNNIIDFIYKNLPQTNINQLLTKNKYDDNYSLT
TLIQNLFLNLSDISDYEQPRNGEKSTNDSNKNSDNSIKNDTDTQSSKQDKADNQKAPKSN
NTKPSTSNKQPNPKPTQPNQSNQSPASDDKANQSSSKDNQSMDSALDSILDQYSEDA
KKTQKDYASQSKDKNEKSNTKNPQLPTQDELKHKSKPAQSFNNDVNQKDTRATSLFETD
PSISNNDSDSGQFNVDSDKTRQFVKSIAKDAHRIGQDNDIYASVMIAQAILES DSGRSAL
AKSPNHNLFGIKAFEGNSVPFNTLEADGNQLYSINAGFRKYPSTKESLKDYSDLIKNGI
DGNRTIYKPTWKSEADSYKDATSHLSKTYATDPNYAKKLSIIKHQYLTQFDDERMPLD
KYERSIKDYDDSSDEFKPFREVSDSMYPHGGCTWYVYNRMKQFGTSISGDLGDAHNWNN
RAQYRDYQVSHTPKRHAADVFEAGQFGADQHYGHVAFVEKVNSDGSIVISESNVKGLGII
SHRTINAAAAEELSYITGK

G2821
>G2821_STAAU8325, UNDEFINED PRODUCT 2706470:2707033 REVERSE MW:20989 SDDKHDFIIEQILSRSCDIESVESWKSSL
LOCUS 112
>G1905_STAAU8325, UNDEFINED PRODUCT 1786046:1787398 REVERSE MW:48776 MKDEQLYYFEKSPVFKAMMHFSLPMMIGTLLSVIYGILNIYFIGFLED SHMISAISLTLP VFAILMGLGNLFGVGAGTYISRLLGAKDYSKSKFVSSFSIYGGIALGLIVILVTLPFSDQ IAAILGARGETLALTSNYLKVMFLSAPFVILFFILEQFARAIGAPMVSMIGMLASVGLNI
>G1906_STAAU8325, UNDEFINED PRODUCT 1787508:1787924 REVERSE MW:16172 QGHTLG YLYAHQQDGLTQNDIAKALQRT GPTVSNLLRNLERKKLIYRYVDAQDTRRNIGLTTSGIKLVEAFTSIFDEMEQTLVSQLS EEENEQMKANLTKMLSSLQ
LOCUS 113
G1111
>G1111_STAAU8325, UNDEFINED PRODUCT 1083909:1085690 FORWARD MW:65093 DPSEINKVIHV D LG I IADCKRFLECLNDKNVETIEHSDWVKHCQNNKQKHPFKLGEEDQVFC KPQQTIEYIGKITNGEAIVTTDVGQHQM WAAQFYFKNHGQWVTSGGLGTMGFGIPSSIGAK LANPDKTVVCFVGDGGFQ MTNQEMALLPEYGLDVKIVLINNGTLGMVKQWQDKFFNQRF SHSVFNGQPDFMKMAEAYG VKGFLIDKPEQLEEQ L D AAFAYQGPALIEVRISPT EAVTPMVPSGKSNHEMEGL
G1112
>G1112_STAAU8325, UNDEFINED PRODUCT 1085693:1085944 FORWARD MW:9621 MTRILKLQVADQVSTLNRITS AFVRLQYNIDTLHVTHSEQPGISNMEIQVDIQDDTSLHI LIKKLKQQINVLTV E CYDLVDNEA
G1113
>G1113_STAAU8325, UNDEFINED PRODUCT 1086069:1087085 FORWARD MW:37588 LEEFIMTT
LOCUS 114
G1542
>G1542_STAAU8325, UNDEFINED PRODUCT 1495403:1497337 FORWARD

MW:72192
APNSRPIDFEMKKKDGTOQFYHYASSVKPARVIFTDSKPEIELGLQSGQFWRKFEVYEGDKK LPIKLVSYDITVKDYAYIRFSVSNGTKAVKIVSSTHFNNKEEKYDYTLMEFAQPIYNSADKFK TEEDYKAELLAPYKKAKTLERQVYELNKIQDKLPEKLKAELYKKLEDTKKALDEQVKSAT EFQNVQPTNEKMTDLQDTKYVVYESVENNE
SMMDTFVKHPIKTGMLNGKKYVMETTNDDYWKDFMVEGQVRVTISKDAKNNTRTIIFPY VEGKTLYDAIVKVHVKTIDYDQYHVRIVDKAFTKANTDKSNKKEQQDNSAKKEATPAT PSKPTPSPVEKESQKQDSQKDDNKQLPSVEKENDASSESGKDKTPATKPTKGEVESSSTT PTKVSTTONVAKPTTASSKTTKDVVQTSAGSSEAKDSAPLOKANIKNTNDGHTQSQNNK NTQENKAKSLPQTGEESNKDMTLPMLALLALSSIVAFVLPKRKRKN
G1543
>G1543 STAAU8325, UNDEFINED PRODUCT 1497540:1497668 REVERSE MW:4973
MAVPKRRTSKTRKNKRRTHFKISVPGMTECPNCGRIQIITPCM
G1544
>G1544 STAAU8325, UNDEFINED PRODUCT 1497751:1497846 REVERSE MW:3849
MSLLNSKQDDSESQVDPRLQKLQQLYDKEQ
G1546
>NONE, UNDEFINED PRODUCT 1497815:1498165 REVERSE MW:12767
DQDDVDEHYHIIKDGVMNLQDIVEDIVIIKPMRAYSEQSDQMLTVGNGWEVIDEDQLDELA KQQATR
LOCUS 115
G2712
>NONE, UNDEFINED PRODUCT 2598712:2601288 REVERSE MW:94980
EVGDRYYNRTIIYTVYLNYNVDFKRRQYTLAKFLYKMGTFIAKHKWSAVIAWIVIVAAIL IPLATNAPKFDNDIKMTGLESLDTNKKIEKHFNQDSEKAQIRVVFKTTKDDGIVQPNITK DIKKTLDIHKDDKHIDKISD
G2713
>G2713 STAAU8325, UNDEFINED PRODUCT 2601346:2601891 FORWARD MW:21879
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G2714
>G2714 STAAU8325, UNDEFINED PRODUCT 2601974:2602138 REVERSE MW:6456
VRYVISIIMGIVLAIWSFKQLSQSHLDSGFIFFFIVYVLCISCFNSDKHDKNNKR

G2715
>G2715 STAAU8325, UNDEFINED PRODUCT 2602253:2603800 REVERSE MW:57130
GS RATGT RIYERSAVVQEGQNFLKRVIAEMGGKDAIVVDEN
IDTDMAAEAI VTSAFGFSGQKCSACSRAIVHKDVYDEVLEKSIKLTKELTGNTVDNTYM
GPVINKKQFDKIKNYIEIGKEEGKLEQGGGTDDSKGYFVEPTIISGLKSKDRIMQEEIFG
PVVG FVKVND FDEAIEVANDTDYGLTGAVITNNREHWIKAVNEFDVGNLYLNRGCTSAVV
GYHPFGGFKMSGTDAKTGSPDYLLHFLEQKVVSEMF
TABLE 9 DNA SEQUENCES STAPHYLOCCOCUS EPIDERMIDIS
LOCUS 1:
GATCGCCTTTACCTGAAACTGTTCCAGCCACTTGATTATATGTGCCCAAGGTACTGTGTGT AATTTAACACCAGGTTTGACGTTGTATGTTTGATTGATTTTTACAGGTGATTTAGCTGTGTT GTAAATGACCTCATCTTGTTTTACCCAAACATAATTTGTACCAGTATTATAATCACCACAA GATAGAATTTTTTATCACCAAGTGTGGCAGCTTTTCGTCACTGACAATGTACGTTGGATTTGA TTTGTGTCTTTCTTTAGTGT CATAAACTGTAGTATATAAGCCACTATTTTTTGCATTGAT TTGAGCAACACCCTATTGTTAGTCACTGTTAATTGGTTGTTTGTGTAAGGTTTAGTTGGAT TGCTAGGTTTAGATGCTGTAGTTAAGTAATATTTACTAATCCAACCAGATTTACC ATTCACCTGTACCATAAAGATACGTTGCTTTATCAATTTGTTGCTGTTTAGTTGCTTTAAA TGTTTGATTTCCAGTACCAGATACTTTGCTAGCAACTTGTTTGGTGTACCCCAAGGAAC TGTGTAAAGTGTGGACCCTGCTTTAACATTATATGTTTGATTCACTTTTACTGGTGCCTT AGCAGTGTATATAAACAACATCACCTTGTTTAAACCAACCGTATTTTTTACCGCTATTGTA GTCTTCAACTAAATAGAATTTGTTATTTCTTAATGTTGCAGTTTTAGTAACGGATAGAGT TTTTTGTACTTGATCAGTCTTATGACCTTTACTGT CATAAACAGTTGTATATAAGCCATT ATTTGTTGGTTTAAATTTGAGCAACACCACGATTAGCAGACACAGTTAACTTATTATTAGT TCCTCCTGATGGTTTAGAAGGTTGTGACGGTTTTGTAGATGTTGTGCCCCAAGGTGCTAC TTGCTTCGTTTTAATTAAATATTTTT CATAAATTAAGTCATATAATTCTGCATAGCTATA ATTGTGACTTCTTAAATATTGGTGAGGGTCAGCGTGATCAGTACCTCCTAAGAAGTTAGA GATAGCAGCATGTGTCCAACTGTTCTCTTCCATCGTTTTTCAGCGCTATCAGGTTTTAA ATTATAATATTGCAATTGCGTTGCAGCATAATCAGCGTAGTTGTTCAATTGAACGTGCAAA TGAATCATAATCATGTGTATGGACGATTTCAACATTGATAAAACGTTGATTTCCATATGG ACCTGCACCCCAAGATAAGTAATCTGTGCGAGCTGTTTCTATAATTCTATTGCCATCAAC AAATGCGGTGTACGAATGCATTTGTGTAATTACGTTTCATGAAAGCAATCTCGCCATCGAT TGTTGAGTTATCATTTGCAGTATCATGAACAACGATACCTTCAGGACGTCCCACACCGTT TCTATAGCCATATTTAGGGAAATATGACGTATAATCTTCTTCAATTCTTGGTGCTTTCAT ATTCTTTTACGAATATAGTTATTTATTGAAGAAATTAACCTTTGGTGTATATTTCCGGTAA TGATGATGTTTTTTGACTAGATACAGAATAAACTGTTCTCGGTTGAGCAGTTGCCTAA TGGGGTGAATTGCTTTGTATCTATAGTCGCTTGATTAGATGCCGTTTCTTTTTTTACAGT ATTAGTTGTTACACGTTGAGCTGGTTCTTTATATTTATATGAAGTAGTTTGTTTAGATGT AGCATTACATTGTTTAAATGAGATAGGCTCTAAATGGTCTGTTGAGCTATCATCGTCTTC ATCATCGTAATCAAAATTTATAACCAGATGCGTTTGTATTTGATACTTTAGGTGTAGCAGT TTCATTTTGTTCAGAAAGTTACTTGCTGACTTTTTTGTGGCTTTTATTATCATTAGAAGC AGTTTGAGTTTCAATTGCTTGATTTTCGGAAGGTTGACTTGCAGTCATCTTCTGTCTTG TTGTTCAATTATTGCGTTAGCTCCTAAATCTTCTCATTCTTTTGTCTACAGATTGTGT CTCTGTAATTGATTGTATCAGTGGATGTTTATCTTCTGTGTCAAATCATTGTTC TTCTGTGATTTTTTGTAAACAGAAATCGTTTGATTTTGATTGCGCATCATCTGTTGATAA AGATTGTTGCTTTTGATTGATGAAATTTCAATTATAAGTACTCATTTTCATCTAATGATGC ATCATATGTAAGTACTTTGTGTGCTTGTGTTAGGTTGAACTTGGGTAGGGTCTTGATATGT TTGTGTACCAGATACATTTGTAGTTGATTGTGTAACCTTCGCTTTTAGCTTTTTCTGCTTG

TTTGAGGGCAGTTTGATC
LOCUS 2:
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LOCUS 3:

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LOCUS 4:
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LOCUS 5:
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LOCUS 6:
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LOCUS 7:
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LOCUS 8 :
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LOCUS 9:
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LOCUS 10:
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LOCUS 11:
GATCCTGAAACACTATTTAT
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LOCUS 12:
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TABLE 10 PROTEIN SEQUENCE STAPHYLOCOCCUS EPIDERMIDIS

LOCUS 1:

ORF1:

DQTALKQAEKAKSEVTQSTTNVSGTQTYQDPTQVQPKQDTQSTTYDASLDEMSTYNEISS
NQKQQLSTDDANQNQTNVTKNQEEETNDLTQEDKTSTDNTQLQETQSVAKENEKDLGA
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KQDEVIYNTAKSPVKINQTYNVKPGVKLHTVPWGTYNQVAGTVSGKGDR

LOCUS 2:

ORF1:

RIGGKYMDNIKIIVASDSIGETAELVARAGVSQFNPKQCKHEFLRYPYIESFENVDEVIQ
VAKDTNAIIVYTLIKPEIKKYMISKVNEHALKSVDIMGFLMELLSNSIETPYEYPGMVH
RLDDAYFKKIDAIEFAVKYDDGKDR

ORF2:

GEAFMVKNMDTIVQLAKHRGFVFPGSDIYGGLSNTWDYGPLGVELKNNIKKAWWQKFITQ
SPYNVGIDAAILMNPKTWEASGHLGNFNDR

ORF3:

RPIELSORQEQUIEIVKSEGPITGEHIAEKINLTRATLRPDAILTMSGFIEARPRVGYF
YSGKSKNKIINEKLRKYVVKDYMSHPVVIKENMTVYDAICTIFLEDVSTLFITNENNDFFV
GVCSRKDLLRASMIGEDIHTMPISVNMTRMPHVSYSYLKEQELVIYAANQMIDKEIDSLPIV
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LOCUS 3:

ORF1:

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ENVK
ORF2:
VESLGRKVKEDGVVIDEKILKVDGFLNHQIDAKLMNDVGKTFYESFKDAGITKILTIEAS
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LKGNKVTLLGEA
ORF3:
NWRLFLMWENKFAKESLTFDDVLLIPAASDVLPSDVL SVKLSDKI
LOCUS 4:
ORF1:
YWTYHFKEKGMVIMDDLKQNSSNEKPKGNKIINILIFIGMILLIQIPIGVSLIALPFS
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ORF2:
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KLIENDITI
LOCUS 5:
ORF1:
QIVQRKGCHLMKIRVIVPCYNEGEVVLKTYDKLTEIMKKDSLKNYEYDLLFINDGSTDT
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ORF2:
DQLLVNQLQPYEQHIKQENRTLEVNFCTDIDAFYQYRPPIERILTNLLDNALKFSNSGSR
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LOCUS 6:
ORF1:
SIAGAAIASQGSFAVLHYQGFTKIIIVLIISPIIAFCVGYMMYTIVKIVFKNSNLTRTNR
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ORF2:
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LOCUS 7:
ORF1:
DHIIRAYHKFLQSGYQTELHLFGRDEDNQIPLMNTLISELKLSDKVKIFKYTNQPLQEFK
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ORF2:
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LOCUS 8:
ORF1:
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SIEAKVNQAKTAFEQFALAVGETFAKSGMLDGIRMVLTQLTGLTHGITELGTTAPIFGMV
GGAASLMSKNVRSGFEGARSSVANYITEVNKLAKVNNAAGQVVGLOKVQGTASQLQFNK
NGEYDKAASQAKAAEQATYQFSKAQKQDVASAMIASGAINKTTVATTASTVATRAATLAV
NGLKLAFRGLLAATGVGLAITGVSVFVLEKVVGSFNAASQAAEQYKQKQEQTKQAIASMSN
GEINSLISSYDKLQKMNSSSAFNTAEAEKYKEVTSQLANIFPDLVTGENRYGKEMAGNK
EVMKQKIELIKQEMELERQKNAIKQKEEQDAYIKEQDSLAKKNRGQKWYQLGQTPCLKLQ
EQARPTTVSDNSNINKINATI QKVKSAQAEKALEQVDKQLAQSQTKNRQNEVQHLQKVR
QALQDYITKTGQANQATRAAVLTAQQQFTNQIATMKKLGTGQQVMTTISNSVAKTAKSG
KAAQATFKSFETSLVKSSSFKSKMASYEASVKKFKNAANQSAKIAALKDVERDYSKVAKG
IMQAAKAANMSKSKQMKDLKKSLOQNIQAETGFRASVSKAGKVTIDQSKKIKQNR
LOCUS 9:
ORF1:
VLWGVFDMDLLIGTLFLILVLVIFTLFTYKAPSGMRAMGALANAAIASFLVEAFNKYVGG
QVFGIKFLEELGDAAGGLGGVAAAGLTALAIGVSPVYALVIGAACGGMDLLPGFFAGYIV
GYMMKYTEKYVPDGIDLIGSIILLAPIARLIATGLTPVVNNTLIKIGDIIQSSTDANPLI
MGIVLGGIITTVGTAPLSSMALTALLGLTGAPMAIGAMAAFFSSAFMNSALFHRKLGLDRK
STISVGIEPLSQADIVSANPIPIYVTNFFGGAIAGIIIAWSGMINNATGTATPIAGFLVM
FGFNSLTKVIIYGVMMAIIGTIAGIVGSIVFKKYPITTKQMLERDTT
LOCUS 10:
ORF1:
MEIKQIKYFVEVVRQGGMTQASEHLYIAQSTISKAIKNIENEYDITLFDQRSQKQIKLTDI
GQTFYDNSLEFLALFEKLSLEMNDIVNVQKGHIKIGLSPMMNVQMFTNALNQFHRLYPNV
TYEVIEGGGKIVENLTSNDDVDIGITTLPVDL
ORF2:
LSSESANSFYLVHDDFLIRIVKECLLTHVNSKMLWRFVMSGFFNRMTRKENPTIYQNKDG
HLKRTLVRVDFLALGVGTIVSTSIFTLPGVVAAEHAGPAVALSFLLAIVAGLVAFTYAE
MASTMPFAGSAYSWINVLFGELFGWVAGWALLAEYFIAVAFVASGFSANLRGLIAPLIGS

LPKSLSNPFGSNGGVIDIIAAVVIIILTALLLSRGMNEAARMENVLVILKVLAILFVIVG
LTAINFSNYIPFIPEHKVTETGDFGGWQGIYAGVSMIFLAYIGFDSIAANSAEAINPQKT
MPRGILGSLIVAIVLVFAVALVLVGMFHYSDYADNAEPVWALRESHGIIAAIVQAI SV
IGMFTALIGMMLAGSRLLYSFGRDGLLPWLSQLNHKHLPNRALVILTIIGVVIGSR
LOCUS 11:
ORF1:
DPETLFIIVMSQILFHLVGGFLLAAAILAAIMSTISSQLLVTSSSLTEDFYKLIRGSDKAS
SHQKEFVLIGRLSVLLVAIVAITIAWHPNDTILNLVGNWAGFGAAFSPLVLYSLYWKDL
TRAGAISGMVAGAVVIVWISWIKPLATINAFFGMYEITPGFIVSVLITYIVSKLTKKPD
DYVIENLNKVKHVKE
ORF2:
DQLFKVTESELIEIQDIGDKLAQSVVITYLENSDIRSLIEKLSNKNVMSYKGIKTTEIEG
HPDFSGKTIVLTGKLEQMTRNEASEWLKMQGAKVTNSVTKSTDIVIAGADAGSKLAKAEK
YGTEIWTEAAPIEKQNGI
ORF3:
MKRTIFLLMSILLLLLTACGDGHKQTSSDKEQSEHKDNHNKNQVKQIATDKKVQGDNYRTI
LPFKESQARGLLQDNMANGYNGEDFESGLLELSKEIFPTNKYLYQDQYLDKKTINAYLD
PKYTKKEIDKMSEKEKKSKNANENLGLNPSHNGETDEEKIAENSPAYLSNILEQDFYGN
DSKGNKIKGMTIGLAMNSVYYYKKEKDGETFSKDLSDKEIEKQKQMASSEMLSRLEN
LKDIPHFALYKQSSQDSITPGEFIVGTTVEEGKTKINSWDNINEKAALIPSSSTAADYDE
TLNNNFQKFNDNLQSYFSNFTQAVGKVKFVNKKAKQLTVDLPIDYYGQAETIGITQYVTE
QAEKYFDKLDYEYIRIKDGNTPRALISKTKDDKEPQVHIYHN
LOCUS 12:
ORF1:
LDTSKGQSSMEEVLKLKIPASTANLGVGFDSIGMALDKYLHMSIRKIERANWEFLYYSSE
LEGLPKDENNYIYQTALNVARKYNVTLPSLQIEMRSDIPLARGLGSSASALVGALFIANY
FGNIQLSKYELLQLATEIEGHDPDNVAPTIYGGIAGFYNPITKITDVARIEVPHVDIILT
IPPYELRTEDSRRVLPDTFSHKGAVQNSAISNTMICALIOHKKYKLAGKMMEQDGFHEPYR
QHLLPEFNQVRKLSRQHDAYATVISGAGPTILTLCPKEKSGKLVRTLREKINNCASELVT
INEIGVKDEVVYLKS
ORF2:
LLKGVLYYMTQYKMVVLDMDDTLMNNDNKLSTETKSYLLDIQKRGYYVVLASGRPTEGML
PTARELELNKYNFSFIISYNGGKTINMANENVEVDQPVSKEDFDNIVDYCRDKNFLVLTID
NGYIIHDSSEYMNIESQLTGLPMNRVADLKEYINHSPKVMGVVDYVGHITEARIELDGY
FNNDIDVTTSKPFFLEFMAKNVSKGNAIKALCKRLQISLEEVIVFGDSLNDKSMFEVAGY
SVAMGNASDELKKIADEVTLDNNSNGIPYALKELLV

CLAIMS

1. An antigenic polypeptide, or part thereof, encoded by an isolated DNA
5 molecule selected from the group consisting of:
 - (i) DNA molecules represented by the DNA sequences in Table 7 or 9;
 - (ii) DNA molecules which hybridize to the sequences identified in (i) which
encode a polypeptide expressed by a pathogenic organism; and
 - (iii) DNA molecules which are degenerate as a result of the genetic code to the
10 DNA sequences defined in (i) and (ii),
for use as a vaccine.
2. An antigenic polypeptide according to Claim 1 wherein said DNA molecule
15 is genomic DNA.
3. An antigenic polypeptide according to Claim 1 or 2 wherein said DNA
molecule hybridizes to the the sequences in Tables 7 or 9 under stringent
hybridization conditions.
- 20 4. An antigenic polypeptide according to any of Claims 1-3 wherein said
polypeptide (s) are represented by the amino acid sequences in Tables 8 or 10.
5. An antigenic polypeptide according to any of Claims 1-4 wherein said
polypeptide is derived from a bacterial genus/species selected from the group
25 consisting of: *Staphylococcus spp.*; *Staphylococcus aureus*; *Staphylococcus*
epidermidis; *Enterococcus faecalis*; *Mycobacterium tuberculsis*; *Streptococcus*
group B; *Streptococcus pneumoniae*; *Helicobacter pylori*; *Neisseria gonorrhea*;
Streptococcus group A; *Borrelia burgdorferi*; *Coccidiodes immitis*; *Histoplasma*
sapsulatum; *Neisseria meningitidis type B*; *Shigella flexneri*; *Escherichia coli*;
30 *Haemophilus influenzae*.

6. An antigenic polypeptide according to Claim 5 wherein said polypeptide is derived from the genus *Staphylococcus spp.*
7. An antigenic polypeptide according to Claim 6 wherein said polypeptide is derived from the species *Staphylococcus aureus*.
8. An antigenic polypeptide according to Claim 6 wherein said polypeptide is derived from the species *Staphylococcus epidermidis*.
9. An antigenic polypeptide according to any of Claims 1-8 wherein said polypeptide is an opsonin.
10. A vaccine composition comprising at least one antigenic polypeptide according to any of Claims 1-9.
11. A vaccine composition according to Claim 10 wherein said composition further comprises a carrier and/or an adjuvant.
12. A method to immunize an animal against a disease or condition caused by a pathogenic microbe comprising administering to said animal at least one antigenic polypeptide according to any of Claims 1-9 or a vaccine composition according to Claim 10 or 11.
13. A method according to Claim 12 wherein said animal is human.
14. A method according to Claim 12 or 13 wherein said disease or condition is selected from the group consisting of: bacterimia; septic shock; organ infection; skin infection; bacterial nasal colonisation; bacterial eye infections; septicaemia; tuberculosis; bacteria-associated food poisoning; blood infections; peritonitis; endocarditis; sepsis; meningitis; pneumonia; stomach ulcers; gonorrhoea; strep throat; streptococcal-associated toxic shock; necrotizing fasciitis; impetigo;

histoplasmosis; Lyme disease; gastro-enteritis; dysentery; shigellosis; *Staphylococcus aureus*-associated septicaemia, food-poisoning or skin disorders; *Staphylococcus epidermidis*-associated septicaemia, peritonitis or endocarditis.

5 15. A method according to Claim 14 wherein said disease or condition is the result of a *Staphylococcus spp* infection.

16. A method according to Claim 15 wherein said disease or condition is *Staphylococcus aureus*-associated septicaemia, food-poisoning or skin disorders.

10

17. A method according to Claim 15 wherein said disease or condition is *Staphylococcus epidermidis*-associated septicaemia, peritonitis or endocarditis.

18. An antibody, or binding part thereof, obtainable by the method according to
15 any of Claims 12-17.

19. An antibody according to Claim 18 wherein said antibody is a monoclonal antibody.

20 20. An antibody according to Claim 18 or 19 wherein said antibody is a chimeric antibody.

21. An antibody according to Claim 18 or 19 wherein said antibody is a humanized antibody.

25

22. An antibody according to any of Claims 18-21 wherein said antibody is an opsonic antibody.

23. An antibody according to any of Claims 18-22 wherein said antibody is a
30 therapeutic antibody or a diagnostic antibody.

24. A method for preparing a hybridoma cell-line producing monoclonal antibodies according to Claim 19 comprising the steps of:
- 5 i) immunising an immunocompetent mammal with an immunogen comprising at least one polypeptide having the amino acid sequence as represented in Tables 8 or 10, or polypeptide fragments thereof;
 - ii) fusing lymphocytes of the immunised immunocompetent mammal with myeloma cells to form hybridoma cells;
 - iii) screening monoclonal antibodies produced by the hybridoma cells of step (ii) for binding activity to the amino acid sequences of (i);
 - 10 iv) culturing the hybridoma cells to proliferate and/or to secrete said monoclonal antibody; and optionally
 - v) recovering the monoclonal antibody from the culture supernatant.
25. A method according to Claim 24 wherein said hybridoma cell-line produces
15 opsonic antibodies.
26. A hybridoma cell-line produced by the method of Claim 24 or 25.
27. A method to identify opsonic antigens expressed by a pathogenic microbe
20 comprising:
- i) providing a host cell transformed with a DNA library encoding genes, or partial gene sequences, of a pathogenic microbe;
 - ii) providing conditions conducive to the expression of said transformed genes or partial sequences;
 - 25 iii) contacting the antigens expressed by said gene sequences with autologous antisera derived from an animal infected with, or has been infected with, said pathogenic microbe;
 - iv) purifying the DNA encoding antigenic polypeptides binding to said autologous antisera; and
 - 30 v) testing the opsonic activity of a polypeptide encoded by said DNA molecule.

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ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

(54) Title: ANTIGENIC POLYPEPTIDES

(57) Abstract: The invention relates to a method for the identification of antigenic polypeptides, typically opsonic antigens, ex-
pressed by pathogenic microbes; vaccines comprising said antigens; and therapeutic antibodies directed to said antigenic polypep-
tides.

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 02/03606

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07K7/04 C07K14/195 C07K16/12 A61K39/02 A61P31/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07K A61K A61P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, EMBASE, EMBL, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EMBL [Online] 16 March 1999 (1999-03-16), BARASH ET AL: "Staphylococcus aureus polynucleotides and sequences" XP002250642 retrieved from AAW89789 accession no. EBI Database accession no. AAW89789 * Refers to EP-A-786519, published 30.07.97 (3271 pages); identical with Locus 1, Sequence 3 [4-363 : 2-361]; and SEQ 544 (EP), complete reversed DNA overlap [1400-5088 : 3689-1/Locus 1] * ----- -/--</p>	<p>1-7, 9-16, 18-26</p>

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

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INTERNATIONAL SEARCH REPORT

International Application No
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE EMBL [Online] 1 June 2001 (2001-06-01), KURODA ET AL: "Whole genome sequencing of meticillin-resistant Staphylococcus aureus" XP002250643 retrieved from Q99WI0 accession no. EBI Database accession no. Q99WI0 * 98% overlap in the region 21-251 [Locus 1, Sequence 4] : 1-231; misfits at 49, 83,141,144 and 229 (of Q99WI0) *	1
P,X	WO 01 98499 A (UNIVERSITY OF SHEFFIELD / BIOSYNEXUS) 27 December 2001 (2001-12-27)	1-7, 9-16, 18-26
P,Y	* See the whole document - antigenic polypeptides from Staphylococcus aureus; SEQ.ID. 32 = identical with Locus 1, Sequence 1; page 5 -> SEREX *	27
Y	SAHIN ET AL: "Serological identification of human tumor antigens" CURRENT OPINION IN IMMUNOLOGY, vol. 9, no. 5, October 1997 (1997-10), pages 709-716, XP004313590 ISSN: 0952-7915 * The original SEREX method / see page 5 of the Application *	27
A	US 6 159 469 A (CHOI ET AL) 12 December 2000 (2000-12-12) * See Abstract - antigenic polypeptides from Streptococcus pneumoniae *	1-26
A	US 6 086 896 A (SPARLING ET AL) 11 July 2000 (2000-07-11) * See Abstract - antigenic polypeptide from Neisseria meningitidis *	1-26
A	US 5 543 323 A (RIDLEY ET AL) 6 August 1996 (1996-08-06) * See Abstract - antigenic polypeptides from Plasmodium *	1-26
A	WOOD ET AL: "Identification of antigenic sites on staphylococcal enterotoxin B and toxoid" FEMS IMMUNOLOGY AND MEDICINAL MICROBIOLOGY, vol. 17, 1997, pages 1-10, XP002250576 * See pages 8-9 (3.3 and 4) *	1-26
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INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 02/03606

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
L	<p>DATABASE EMBL [Online] 20 February 2003 (2003-02-20), MASIGNANI ET AL: "Staphylococcus aureus proteins and nucleic acids" XP002250644 retrieved from AX618827 accession no. EBI Database accession no. AX618827 * Refers to W002094868, published 28.11.02 (international filing date 27.03.02, priority date 27.03.01) without sequences (electronically filed only) - see Locus 1, Sequence 1 = 100% identity *</p>	1-26
L	<p>DATABASE EMBL [Online] 20 February 2003 (2003-02-20), MASIGNANI: "Staphylococcus aureus proteins and nucleic acids" XP002250645 retrieved from AX618829 accession no. EBI Database accession no. AX618829 * As above; identical with Locus 1, Sequence 2 (except the first amino acid) *</p>	1-26
L	<p>DATABASE EMBL [Online] 20 February 2003 (2003-02-20), MASIGNANI: "Staphylococcus aureus proteins and nucleic acids" XP002250646 retrieved from AX618833 accession no. EBI Database accession no. AX618833 * As above; identical with Locus 1, Sequence 3 (except the first amino acid) *</p>	1-26
L	<p>DATABASE EMBL [Online] 20 February 2003 (2003-02-20), MASIGNANI: "Staphylococcus aureus proteins and nucleic acids" XP002250647 retrieved from AX618835 accession no. EBI Database accession no. AX618835 * As above; identical with Locus 1, Sequence 4 (except the first amino acid; erroneous omission of 241-251 ?) *</p>	1-26

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 02/03606

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
see FURTHER INFORMATION sheet PCT/ISA/210
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-26 (all partially) and 27 (entirely)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.1

Although Claims 12-17 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the polypeptides/compositions.

Note also that "or part thereof" (Claim 1) has no clear meaning - it would even cover dipeptides in an extreme interpretation.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-26 (all partially) and 27 (entirely)

Invention 1:

Claim 27 (the method used) and a first group of antigenic polypeptides (the 4 peptides of Locus 1, encoded by the first DNA sequence in Table 7), including their uses etc. as of dependent Claims 2-26, as applicable.

Inventions 2-134:

As invention 1 but limited to each subsequent group of peptides as encoded by the 2nd, 3rd,..., 122th DNA sequence in Table 7, and the 123th,..., 134th DNA sequence in Table 9, as applicable.

Note:

As a consequence of the lack of information in the Description about sequence relations (e.g. common subsequences ?) etc, the actual number of inventions may deviate from the above.

This is, however, not of significance at present.

INTERNATIONAL SEARCH REPORT

information on patent family members

Inte Application No
PCT/GB 02/03605

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0198499	A	27-12-2001	AU 7424801 A BR 0111823 A CA 2412504 A1 CN 1437653 T EP 1292681 A1 WO 0198499 A1 NO 20025838 A US 2003186275 A1	02-01-2002 10-06-2003 27-12-2001 20-08-2003 19-03-2003 27-12-2001 18-02-2003 02-10-2003
US 6159469	A	12-12-2000	US 6573082 B1 US 2002061545 A1 AU 5194598 A AU 6909098 A EP 0942983 A2 EP 0941335 A2 JP 2001505415 T JP 2001501833 T WO 9818930 A2 WO 9818931 A2 US 2002032323 A1	03-06-2003 23-05-2002 22-05-1998 22-05-1998 22-09-1999 15-09-1999 24-04-2001 13-02-2001 07-05-1998 07-05-1998 14-03-2002
US 6086896	A	11-07-2000	US 2003104002 A1 AT 242784 T AU 8298991 A CA 2087160 A1 DE 69133276 D1 DK 539492 T3 EP 1338607 A2 EP 0539492 A1 JP 3329452 B2 JP 6502394 T JP 2002233390 A WO 9201460 A1	05-06-2003 15-06-2003 18-02-1992 17-01-1992 17-07-2003 22-09-2003 27-08-2003 05-05-1993 30-09-2002 17-03-1994 20-08-2002 06-02-1992
US 5543323	A	06-08-1996	AT 97693 T AU 633306 B2 AU 5121590 A CA 2011031 A1 DE 69004721 D1 DE 69004721 T2 DK 388738 T3 EP 0388738 A1 ES 2059855 T3 GB 2230009 A ,B IE 64212 B1 JP 3047088 A PT 93416 A ,B ZA 9001757 A	15-12-1993 28-01-1993 01-11-1990 14-09-1990 05-01-1994 17-03-1994 17-01-1994 26-09-1990 16-11-1994 10-10-1990 26-07-1995 28-02-1991 07-11-1990 28-11-1990